THE IRON AGE

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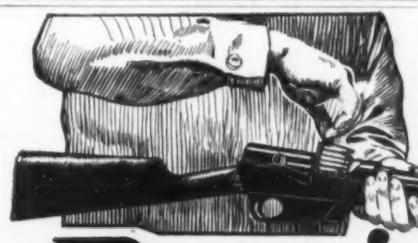

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THE IRON AGE

New York, Thursday, July 4, 1907.

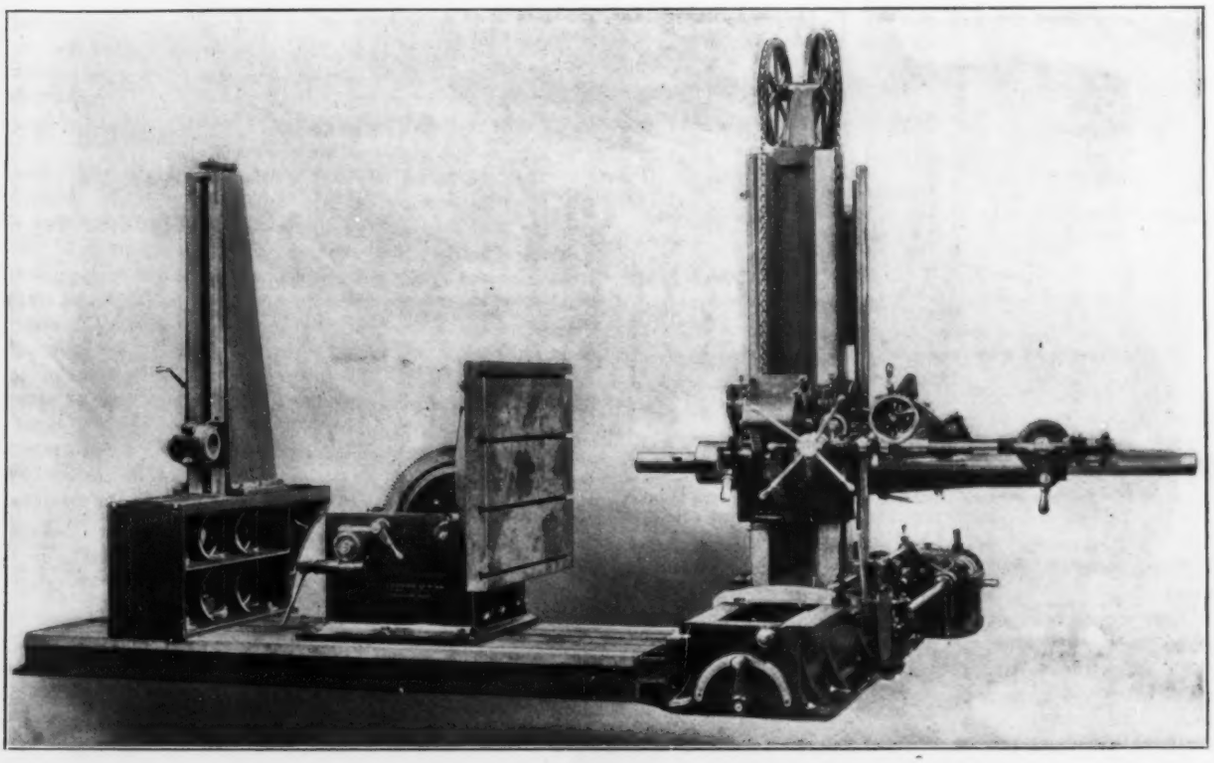
A New Fosdick Boring, Drilling and Milling Machine.

An improved form of tool for boring, drilling, milling or tapping at any angle, known as the style D No. 2 horizontal boring, drilling and milling machine, is now being built by the Fosdick Machine Tool Company, Cincinnati, Ohio. It is ordinarily arranged for a single driving speed, which can be had by belt or gear connection to a constant speed motor, but if desired a five-step cone pulley can be substituted to give changes in driving speed.

The work supporting member is a 42 x 127 in. bed plate tongued and bolted to the base, which carries the tool proper. The column carrying the saddle has a wide scraped bearing on the upper surface of its base and is held down to a sliding fit by adjustable gibs. On this column is mounted the spindle head, which also is gibbed to a sliding fit on a wide scraped surface. The longitudinal travel of the column on its base is 62 in., and the vertical travel of the spindle head is 54 in. The spindle head is counterbalanced and can be adjusted by the pilot wheel, or can be raised and lowered or the spindle fed by power. Eight rates of power feed, all reversible, are provided, and they can be applied to feed the column horizontally on the base, the spindle head vertically on the column, or the spindle horizontally. In a similar manner the same movements can be effected by hand through the pilot wheel—*i. e.*, it also can be used to run the column forward and back, raise or lower the spindle head, or advance or retract the spindle rapidly. For heavy milling it is preferable to feed the cutting tool by moving the column backward or forward on its base, as this throws the strain of the cut upon a screw of suitable diameter and lead having ball thrust bearings. This feed is controlled by the lever, which plays over the semicircular guide on the front of the base.

The drive is transmitted through a gear box affording positive changes in speed, which are easily and noiselessly made. Six changes of speed are obtained through this box and the range is doubled by two changes on the head, making 12 possible spindle speeds from 4 to 260 rev. per min. By means of a friction device of powerful toggle type, placed between the back gear and the speed changing device, the entire machine may be started, stopped and reversed without injury.

The spindle sleeve bearings are large in diameter and long, and consist of adjustable taper bronze bushings through which wear is conveniently taken up. The spindle sleeve is fitted with a threaded collar of large diameter, which carries a device for securely tightening the spindle bar centrally in any position. The spindle bar is 4 in. in diameter, has a No. 6 Morse taper socket and has a 30-in. travel by hand or power.



The Style D No. 2 Horizontal Boring, Drilling and Milling Machine Built by the Fosdick Machine Tool Company, Cincinnati.

The bedplate carrying the universal table and outboard bearing contains an inserted rack which is engaged by pinions operated by ratchet wrenches on the outboard bearing and universal table to move those parts to and from the spindle. The horizontal movement of the outboard bearing parallel to the main bed is operated by a second rack and pinion, while the vertical movement is controlled by a crank and screw. For the horizontal movement of the column, the vertical movement of the spindle head, all movements of the outboard bearing and the horizontal movement of the spindle, scales are provided to assist quick setting.

The universal table has a 40 x 46 in. platen which can be tilted and swiveled to hold the work at any angle. A hole bored through its center admits passing the boring bar through to the outboard bearing. The tilting and swiveling motions are imparted to the platen through a worm and worm gear in conjunction with a circular rack and pinion, and clamps are provided to rigidly hold all parts in any position.

The weight of the entire machine is 21,000 lb.

Experiences with Limber and Stiff Rail Sections.*

Mechanical and Metallurgical Phases of the Question.

BY P. H. DUDLEY.†

I made a brief comparison of the mechanical properties of different rail sections in a preceding paper, indicating that the stiffer sections would carry larger bending moments than the weaker sections, in distributing the wheel loads and generated wheel effects of locomotives and cars to the cross ties, ballast and road bed. The early limber steel rail sections of 3¾, 4 and 4¼ in., and even those of 4½ in. in height, 50 to 65 lb. per yard, distributed only a small percentage of the wheel effects to the wheel spacing, owing to their inadequate stiffness and strength. The major portion of the wheel loads was concentrated in passing upon each cross tie, which was

Fig. 1.—Laminæ of Metal Are Shown, with Slag Inclusions Crushing Under the Wheel Loads.—The cusp forms at the point of weakest resistance—a slag inclusion of large dimensions—then by shearing the checks develop upward and transversely under the rolling loads, separating and expanding the upper layer of metal in the bearing surface from the core of more or less fragile segregated metal underneath, thus starting the vertical check.

cut rapidly in the rail seats and disturbed the ballast and roadbed.

The average generated kinetic effects of the rolling wheels on the limber rails doubled or trebled their static loads, and this enhanced the destructive work upon the track, augmented the train resistance and cost of maintenance of motive power, rolling stock and track. The static wheel loads of the locomotives and cars did not increase sensibly over those developed upon the iron rails, owing to inability to maintain the tracks as smooth as desired, even under the weights as then constructed.

Stiff rail sections were designed to carry locomotive and car wheels ½ to 1½ in. higher above the cross ties than the limber rails, by the use of only 25 to 50 per cent. more metal. Stiffer, stronger and smoother tracks have made it possible to more than double the wheel loads and expended tractive effort of the locomotives upon the same roadbeds in the past two decades. The first 100-ton passenger locomotive did not go into service until 1890, six years after the first 5-in. steel 80-lb. rails were laid in 1884.

Experience with Iron Rails.

The strap iron rails of 70 years ago were able only to establish locomotion for light wheel loads, and failed when they reached 2 and 3 tons, owing to the generated wheel effects in rolling over the irregular surfaces of the rails and to the undulations of the track. The iron T sections failed in the fifties and sixties, when the wheel loads had developed to 10,000 and 12,000 lb. and the speeds to 30 or 40 miles per hour.

The physical properties of the metal, with its 1½ to 2 per cent. of included slag and imperfect welding of the bars composing the pile, were inadequate to prevent crushing and laminating in the bearing surface under the rolling wheel loads. The utmost care in manufacture, either in England, Wales, or this country, could not make iron rails which would long endure heavy traffic. It was not carelessness, incompetence or dishonesty of the iron masters, as often alleged, but the fact that the work required of the metal exceeded its physical properties, and fatigue, failure and fracture were the inevitable consequences after short service.

The operations of the railroads, due to the commercial demands and development of transportation in 30 years after their inception, outgrew the physical properties to be obtained in iron rail sections. The heavier iron sections failed with greater rapidity than had the lower and weaker sections under the same service. The heads of the T-rails were then made pear-shaped, to prevent breaking down under the wheel loads. But this did not check it. There were similar effects to those now experienced with piped and split rails under the heavy wheel loads.

The First Bessemer Rails.

The failure of the iron rails to sustain the wheel loads in the bearing surface, and their fracture as girders for distributing the loads to the cross ties, was a subject of earnest solicitude to the railroad officials, and Bessemer steel rails were welcomed and extensively used. Their cost for many years limited them to light and flexible sections, which carried and distributed only small bending moments. The intensities of the wheel contact pressures per square inch were also small, and moderate physical properties in the steel were ample for the service, while the rate of wear was slow. The positive bending moments under the wheels did not reach 200,000 inch-pounds over 10 or 12 times daily, while the estimated intensities of the pressure per square inch in the bearing

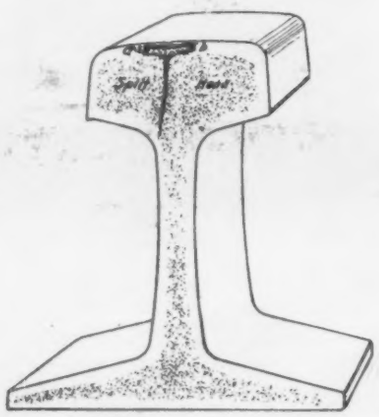


Fig. 2.—Shows the Vertical Check Developed Until the Head is Split.—The layer of metal in the bearing surface unchecked vertically at either *a* or *b*; the split widens as it expands transversely, for the metal underneath becomes the anvil for the blows delivered by the rolling wheels.

surface were under 80,000 lb. from measurements of static loads.

Important Gains from Stiff Sections.

To raise the bearing surface of the rails above the cross ties ½ to 1½ in. higher than the limber sections may seem small in the sense of dimensions; but when utilized in the design of sections of rails, with corresponding proportions of metal, the mechanical properties secured for carrying and distributing heavier wheel loads increased their capacity 50, 100 and even 200 per cent. in the different sections. The gain due to the enhanced mechanical properties in the sections, saving destructive work to the cross ties and roadbed, can be secured only

* From a paper read at the Atlantic City meeting of the American Society for Testing Materials, June 21, 1907.
† New York Central & Hudson River Railroad.

by a greater intensity of pressure under the wheel contacts, and increased work of the sections as girders to distribute their loads. For this proper provision must be made in the physical properties and soundness of the metal used.

The positive bending moments in the stiffer sections are 60 to 100 times daily over 600,000 inch-pounds in some 100-lb. rails, under the heavier wheel loads and high speed trains. The percentage of the wheel loads distributed to the wheel spacing is greater and the total bending moment produced by the wheel effects augments the wheel contact intensities two or three times their former amounts in the light sections.

The depression of the stiffer rails from the truckmen's surface is from ⅛ to ⅜ in., compared with ⅝ to 1 in. under the former light and limber rails. The maximum deflections in either case occur at or near the joints.

New York and Chicago, separated by 960 miles in distance, are but 18 hours apart by train on stiff rails.

The expended tractive effort has increased from 500 to 1200 or more horsepower—a decided factor in augmenting the wheel contact pressures, bending moments and consequent stresses in the rails as girders.

The steel bridges installed with the limber rails for an expected life of a century have been replaced by those of more than double capacity for wheel and train loads, to realize the benefits of the stiff rails to handle the unexpected development of traffic.

Strength and Weakness of Early Rails.

The experience with the early limber rails was that the quality for the light wheel loads was satisfactory, but their deficiencies were their small mechanical properties in comparison with the increasing wheel loads. Endurance shafts have been made from a number of those early

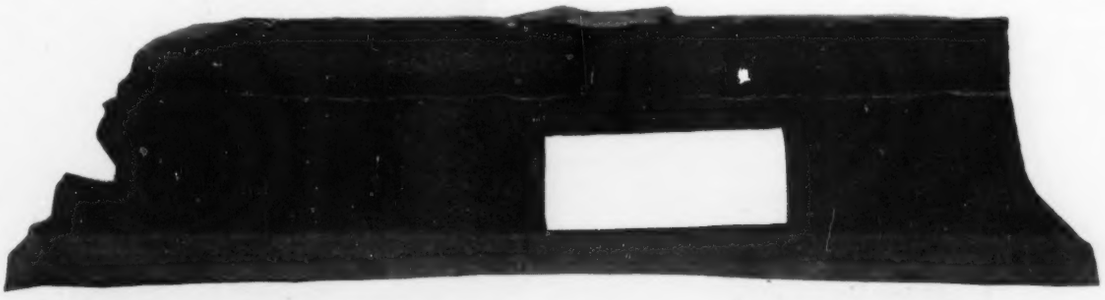


Fig. 3.—Side View of Rail from Which One Side of the Head Has Split, After 14 Years' Service.—5⅛-in. 80-lb. rail, rolled in 1892 and laid same year in track No. 1, main line, N. Y. C. & H. R. R. R., west of Savannah; relaid in track No. 4, 1903. Side of head detached and section broke as a girder February 24, 1907. Head lost in hight ⅛ in. for estimated 144,000 tons of high speed trains and 72,000,000 tons of heavy freight traffic. Traces of slag in bearing surface but none on side walls of fracture.

Fig. 4.—Piece Split from Head of Rail.—5⅛-in. 80-lb. rail, rolled 1892, laid same year, broke in February, 1907. Traces of slag in bearing surface, and the lines visible between separated metal underneath. Trace of minute seam in center of head.

Fig. 5.—Top View of Fig. 4.—The irregular line of fracture in the bearing surface and the bruised surfaces of the lower plane of separated metal of the central core of the head are well defined. The dark part of the bearing surface is the black streak in the rail, which indicates to the trackmen a split head is developing.

The increased stiffness and strength of the sections give a smoother track, with firmer joints and less undulations, even when carrying the larger bending moments of the doubled and trebled wheel loads. The percentage of generated destructive wheel effects on the limber rails has been reduced more than one-half by the stiffer and smoother rails, and this has enabled the static and paying loads to be augmented in a greater ratio.

Increase in Wheel Loads.

The former 20,000-lb. capacity freight cars have been replaced by those of 60,000, 80,000 and 100,000 lb., the 60,000-lb. being the light car of to-day, while the 100,000-lb. is the standard for mineral traffic.

The freight train load has increased from 500 and 600 tons to 3000 and 4000 tons and the volume of traffic in like ratio. The axle loads under freight locomotives have risen from 25,000 to 50,000 lb., with four pairs coupled instead of two, and in the passenger service 55,000 and 57,000 lb. are common for recent locomotives, which attain speeds of 80 miles per hour daily to maintain their schedules of 54 miles per hour including stops.

rails which rendered 12 to 15 years' service, and at 35,000 and 40,000 lb. unit fiber stress they have sustained only from 600,000 to 3,000,000 rotations, excepting a single brand of steel, in which the elastic limits were from 52,000 to 56,000 lb.

When the ingots were worked into blooms under steam hammers their unoxidized blowholes were welded and formed solid steel as a rule for subsequent rolling into rails. This important fact, with the limited work required of the metal in sustaining the light wheel loads, has misled many railroad officials and investigators as to the essential physical properties in sound steel which are required in combination with large mechanical properties in sections, both for wear and as girders to carry the present wheel loads and high speed trains.

The Demands Upon the Mills.

The distances between the producer and consumer in this country are so vast that over 30,000,000 tons of steel rails are required in the 220,000 miles of main tracks, or nearly 10 times the amount in Great Britain. Our steel plants must be commensurate in size and

scope, and run at full capacity for the 3,000,000 or more tons of yearly output demanded. The mills have been remodeled, then rebuilt from time to time for greater output, as conditions of manufacture changed, and the unit of production per unit of time for the limber sections has been multiplied several times for the stiffer and heavier sections.

It is legitimate and proper to save all the time possible between the distinct steps in the process of manufacture. Rapidity of operation does not cause deterioration in quality until the essential time for a step in the process is unduly reduced. The Bessemer departments have not been enlarged proportionately to the other parts of the mill, but the converters have been driven faster, and, after recarburizing the blown metal, the time for complete chemical reactions and escape of the slag has been reduced unconsciously before teeming of the ingots. The reactions but partially complete themselves in the setting steel of the ingot, and the slag, oxides and gases are often entrained instead of eliminated.

The minute globules or particles of slag from the reactions, which are caught in the columnar structure, also in the secondary zone of blowholes, with or without associated oxides, are important factors in the checking of

Fig. 6.—End View of Split Head of 90-Lb. A. S. C. E. Section, C., C., C. & St. L. R. R.—Rolled in August, 1905; laid in September, 1905, and removed July 27, 1906.

the tender skin of the ingots in blooming; also in the subsequent tearing of the flanges, as their extreme edges must slip in the passes of the rolls. The percentage of second quality and condemned rails is increased by these conditions.

Cause of Split Heads.

The slag and occluded gases in connection with segregated metal are important factors in split heads of rails. These develop after a short or long period of service, depending upon the thickness of the metal in the bearing surface, over the entrained slag and occluded gases. The paper already mentioned, Vol. 5 of the Proceedings, stated:

> The splitting of the head in the earlier rails was in nearly all cases traced directly to a pipe in the ingot. These conditions still exist; yet there are numerous instances in which the "pipe," so-called, did not develop in cooling, but does in service, in unsound metal for the central core of the steel [in Figs. 1 and 2 herewith]. Pieces break from the side of the head, in steel where such decided liquation has occurred in the ingot as to make two or more grades of steel in the head.

Continued examinations have been made of numerous fractures of split heads, designated by the trackmen as "pipes." These did not develop in cooling of the metal at the mill, but after short or long periods of service in the track. This type is the most frequent in the rapid increase of failures from so-called "piped rails" of recent manufacture. The shrinkage of the metal in cooling at best is only a minor factor as a contributing cause. Moreover, the split heads are not confined to rails from the tops of ingots, but have been found in less numbers from all the rails of the ingot, where they have been lettered or numbered for subsequent identification.

From a rolling of 10,000 tons of September, 1900, of the A. S. C. E. 80-lb. section by July 1, 1906, 9.61 per

Fig. 7.—Side View of Same Rail as Fig. 6.—Segregated metal shows but not the slightest trace of a pipe. Seven minute threads of slag were counted in the thin layer of separated metal of the bearing surface.

cent. of the rails had been removed from the track for split heads.

Subsequent rollings are showing split heads, though the percentage of removed rails is not yet as high of the same brand. From a rolling of 3000 tons in September, 1903, by another mill, over one-fourth of the rails were removed in 1904, of which a large per cent. had split heads in connection with otherwise decidedly unsound metal.

Threads of Slag.

Rails were taken from the track which indicated a split head had started to develop and slag was found as a series of minute flattened longitudinal threads in the thin layer of metal in the bearing surface over the developed vertical check in the metal underneath, as illustrated in Fig. 1. Were we to request our mechanical engineers to supply mechanism to split the rail heads

Fig. 8.—Side View of Piece from Side of 5⅛-In. 80-Lb. Rail, —Rolled 1901, broken March 15, 1907. This was a piped rail from a well defined cavity in the ingot, the side walls oxidizing in heating. The piece was detached by the spreading of the metal in the bearing surface.

they would be unable to furnish in so few parts accumulators of such destructive forces.

The illustration in Fig. 2 shows the separated metal in the bearing surface as expanded sufficiently to complete the check from the upper to the lower portion of the head. The cusp point by the expanding of the metal sidewise is now located slightly beyond the first check. The under side of the expanded metal shows the shearing and stretching from the repetitions of the numerous wheel loads in passing over the rail.

Chemistry and Mill Treatment.

The composition of the steel rails shown in Figs. 3 and 4, is carbon, 0.55 to 0.60; manganese, 1.00 to 1.20; silicon, 0.10 to 0.15; phosphorus, not to exceed 0.06; sulphur, not to exceed 0.07. The copper, which was not specified, averaged in those rails 0.7 to 0.8. The iron was remelted in cupolas, and the temperature of the heat in the converter regulated by 1800 to 2000 lb. of scrap, charged before the receipt of the molten iron. The bath was recarburized in the converter and the metal poled in the ladle by thrusting in a green wood pole. It was 1 or 2 min. before teeming of the ingots commenced; the ladle nozzle was 1⅛ in. in diameter, and 6 or 7 min. were consumed in pouring the 10-ton heat in five ingots, 15 x 15 in. square on the base and of sufficient length for three 30-ft. rails. The ingots were charged into horizontal furnaces, rolled direct in 13 passes, 3½ min. from first blooming to the finishing pass. The hot rails were sawed ½ in. longer than for present practice, spaced 6 in. apart on the hot beds and turned after recalescence of the head.

Five hundred thousand tons of rails of that character were made, with the exception that for the 100-lb. sections the carbon was raised 5 to 10 points and the manganese about 10 points higher than for the 80-lb. rails. To date only 18 specimens are known to have developed what may be termed split heads or "piped rails," as generally understood by the latter term.

Rails from the Top of the Ingot.

The rails from the ingots were lettered A for the top rail, B for the second rail and C for the third. These letters can be found in the tracks, and, as would be expected, the A rails have a larger percentage of impurities than the B or C rails. They wear faster, developing more surface defects, and at several points upon the road, under heavy traffic, after 10 and 12 years' service, have become practically worn out for main line traffic, while the B and C rails are still good.

I do not wish to convey the impression that no more split heads will occur in these rails. As the bearing surface becomes worn down from year to year a number of heads will probably split from the causes already indicated.

It should be stated in reference to these defective rails that many times the minute quantities of slag in the bearing surface, without a larger blowhole in the secondary zone, do not always produce a split head, but the surface wearing away the metal flows laterally from the bearing surface without splitting the rail head. It is also well known that where the rail head is composed of steel of a high degree of porosity the metal will flow sidewise to the outer edge without making a split head.

The rails of the composition above mentioned have rendered excellent service as girders, rarely breaking in extreme cold weather. The explanations in reference to Fig. 4 also apply to Fig. 5, as part of the same rail.

The pieces of rails in Figs. 6 and 7 illustrate split heads from the breaking of a thinner layer of metal in the bearing surface than that in Figs. 3, 4 and 5. The rail failed after 11 months of service. The ingots were teemed with a 3-in. nozzle.

Dry Air for the Bessemer Converter.

My records show as a general observation that rails rolled in August and September, when there is so much humidity in the air, have developed split heads in greater numbers than those rolled during the winter season. The moisture per cubic foot of air in August and September is often as high as 5 or 6 grains, while it may not be one-half of that amount during the winter weather.

The use of refrigerated air in which the moisture was reduced to a low limit would be preferable in the Bessemer converters. Each ton of metal converted requires approximately about 0.6 ton of air to be blown through it, and with a large percentage of moisture it affects the physical properties of the metal by a greater inclusion of gases. The practice of many mills with direct metal to use a jet of steam to regulate the temperature of the blowing metal in lieu of scrap is decidedly objectionable and injurious to the resulting product.

The piece of rail represented in Fig. 8 was broken from the head of a piped rail. The side walls of the pipe, which had been closed in rolling, were oxidized in the soaking pits. The failure of the rail, however, was due to the spreading of the metal in the bearing surface, as already indicated. Seams from inclusions of slag are visible on the under side of the head. This type of split heads from a well defined pipe was common in the early steel rails, in which the ingots were cooled before being charged into the furnace.

Fig. 9 shows a section of split head of a 100-lb. rail having minute layers of slag in the bearing surface. These are just visible under magnification of 25 diameters. Seams which have developed in the bearing surface are noticed in this view, as well as in Fig. 10, which is from the same rail. The tonnage which had passed over this rail is estimated at 350,000,000 tons. In Fig. 10 definite traces of the segregated metal appear, but without seams, except those immediately in the bearing surface. The metal while segregated is comparatively

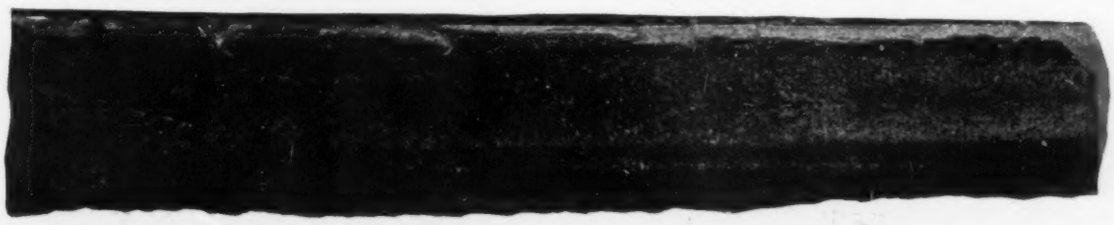


Fig. 9.—Longitudinal Section of Split Head of 100-Lb. Rail, New York Central Lines.—Rail rolled in May, 1903, laid in the following June in Grand Central yards on inbound main track, and removed June 12, 1907. Removed from track for the purpose of tracing the split in the head before the surfaces were completely oxidized. Minute layers of slag have been noticed in the bearing surface.

Fig. 10.—Shows Definitely Traces of the Segregated Metal but Without Seams, Except Those Immediately in the Bearing Surface.—The split had extended 10 ft. in length in this rail, and probably in another month would have extended two or three feet further. The lower dark surface of the section is from oxidation from the openings below the head of the rail. The minute curved lines as the fracture proceeded may be noticed in this specimen.

sound, as indicated by the enormous tonnage it carried. The loss in hight from service is about ⅛ in.

Segregation and Split Heads.

The percentage of split heads can be decreased by giving the metal in the ladle more time for the slag, oxides and gases to escape before teeming than is usual in the present rapid practice. It needs only a return to the older methods of allowing more time after recarburizing for the chemical reactions, escape of the slag, oxides and other impurities to improve the soundness of the ingots. In the large ingots, those of 20 x 21 in. or 24 x 27 in. on the base and comparatively short, the steel can be made to set sounder and better than in the smaller bases and proportionately longer ingots. The escape of the slag must be in the ladle before teeming to prevent it being entrained in the skin of the ingot. The segregation in the larger ingots with the longer time of cooling seems to be more pronounced, but, unless layers of slag are found in the exterior portions of the head of the rail, split heads have not so far been as numerous in that type of ingot as in the ingot of relatively smaller base, but longer. The number of seconds and condemned rails is also proportionately less.

The heavy wheel loads of the present service must be expected to affect the metal in the bearing surface more quickly than was the case with the lighter loads on the limber rails. It is quality and sound metal that is required in any form of section at the present day to sustain the high speed trains, heavy wheel loads and large expenditure of tractive effort.

The 75, 80 and 100 lb. stiffer rails, which were made with 0.06 phosphorus and 0.50 to 0.65 in carbon, have sustained the present heavy traffic for a number of years in the bearing surface without undue wear, and have not broken as girders under the high speed trains, heavy axle loads and the large expenditure of tractive effort. The failure by the breaking down of the rail heads has been traced in all cases to unsound metal, rather than its distribution in the section. The failure of recent rolled rails in the heavy sections, either as to rapid wear or breaking of the heads or the entire section, seems to be due to inadequate physical properties in combination with unsound metal. To sustain the heavy service and with the large output demanded it is more difficult to make a rail, owing to the lack of time for the necessary steps in the process, rather than to deficiencies in the processes themselves, except as to the high phosphorus and sulphur. The high phosphorus, even with low carbons and cold rolling, makes a metal of greater fragility than was produced with the lower phosphorus and higher carbons, when rolled even at the higher temperatures of the preceding decade.

Compression of the ingots would check the segregation of the metalloids in those of large dimensions, and the discard required for sound metal would be small.

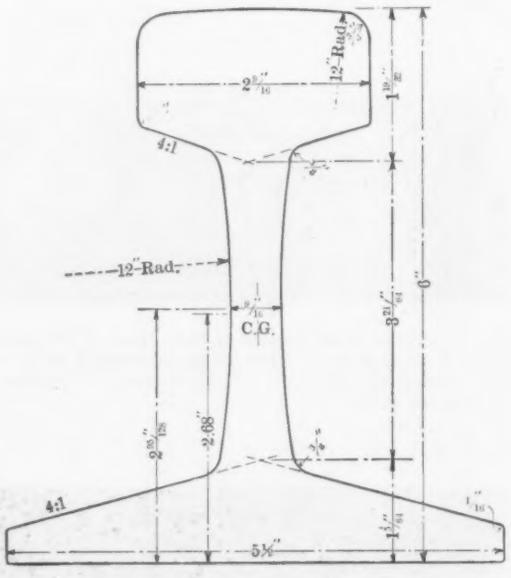
The metal for the rail can be an alloy, and a range in physical properties can be secured for wear and for girder service with greater toughness to resist shocks in zero or lower temperatures.

The metallurgical problem is one limited by cost, since we are not now confined to a single metal, as was formerly the case with iron rails. Progress in transportation will not be limited by specifications, but will meet the commercial demands with larger factors of safety for the future.

While high speed steel has proved very useful for lathe and planer tools, milling cutters, reamers, &c., it has not yet shown the same practicability for taps, threading dies and chasers, which cannot be ground after hardening. The reason is that most grades of high speed steel have to be raised to such a high temperature when hardening that the sharp edges of the tools are practically melted away; and, as a rule, unless a tool can be ground after hardening, it is almost useless for cutting purposes. It is not meant by this that it is impossible to make taps and threading dies from high speed steel, but the difficulties encountered in successfully hardening these tools are such that manufacturers hesitate to make them.

A Proposed 100-Pound Rail Section.

The designing of new rail sections has been under way in various quarters recently, manufacturers, railroads and consulting and inspecting engineers all being occupied with the problem. In all cases the aim is to provide more metal in the rail base. Capt. R. W. Hunt, Chicago, who is secretary of the American Society of Civil Engineers' Committee on Steel Rails, has given considerable study to the report that committee will present at the society's meeting in the City of Mexico, July 8, and has designed a new 100-lb. rail section. From the *Engineering News* we reproduce the accompanying data, with an illustration of the proposed section, which differs materially from the American Society of Civil Engineers type. The narrow head and the thick flange, the latter narrower than the prevailing type and containing even more metal than the head, are the special features of the Hunt section. It is stated that it has been designed with



New 100-Lb. Rail Section Designed by Capt. R. W. Hunt.

a view to rerolling under the process of E. W. McKenna. After the second rerolling the new 100-lb. section would come to an 80-lb. section of similar proportions. In the following table the dimensions of the new section are compared with those of other 100-lb. sections:

Dimensions of Heavy Rails.

Rail section	Hunt.	Am. Soc. C. E.	Dudley. (N. Y. Central Ry.	A., T. & S. F. Ry.
Weight per yard, pounds	100	100	100	101
Hight, inches	6	5¾	6	5¾
Width of base, inches	5½	5¾	5¼	6¾
Width of head, top, inches	2 9/16	2¾	..	2 9/16
Width of head, bottom, inches	2 9/16	2¾	3	2 9/16
Side of head, slope	Vertical.	Vertical.	4°	Vertical.
Depth of head, inches	1 19/32	1 45/64	1⅝	1½
Hight of web, inches	3 21/64	3 5/64	3 13/32	3 13/64
Depth of base, inches	1 5/64	21/32	21/32	13/64
Thickness of web, inches	9/16	9/16	19/32	9/16
Thickness of edge of base, inches	..	5/16	5/16	..
Hight to c. of bolt hole, inches	2 25/128	..	..	2⅜
Radius, top of head, inches	12	12	14	12
Radius, top corner of head, in.	⅜	5/16	5/16	5/16
Radius, bottom corner head, in.	⅛	1/16	1/16	1/16
Radius, top fillets, inches	⅜	¼	½	¼
Radius, bottom fillets, inches	⅝	¼	5/16	¼
Radius, corner of base, inches	1/16	1/16	1/16	..
Radius, sides of web, inches	12	12	14	12
Edges of base	Vertical.	Vertical.	Vertical.	Vertical
Fishing angles	4 to 1	13°	14°	13°
Metal in head, per cent	36.07	42	40.8	..
Metal in web, per cent	23.00	21	23.5	..
Metal in base, per cent	40.93	37	35.7	..

The moment of inertia of the section shown is 48.39. The cross section is 9.87 in. divided as follows: Head, 3.56 sq. in.; web, 2.27 sq. in.; base, 4.04 sq. in. It is stated that the new section has been adopted by a large railroad system, but no rails have yet been rolled under it.

New Becker-Brainard Milling Machines.

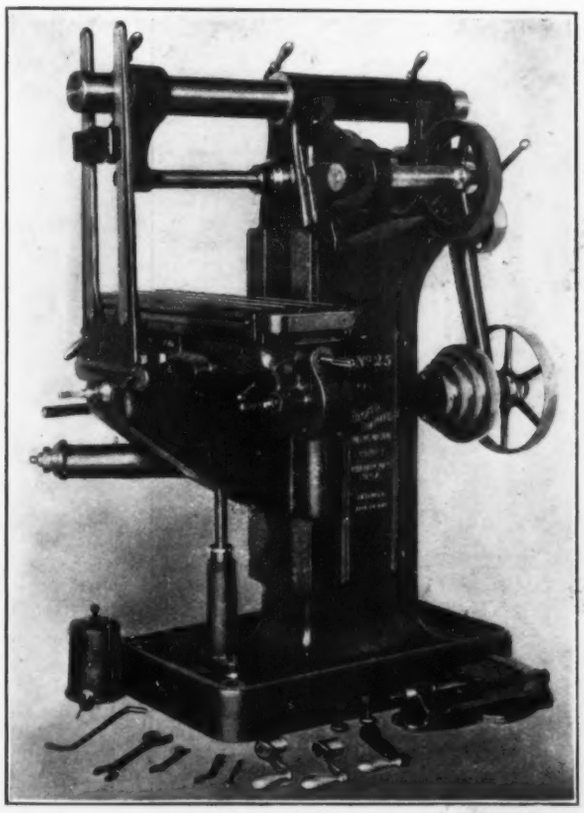
The Nos. 25 and 26 plain horizontal milling machines made respectively with and without back gears, are new products of the Becker-Brainard Milling Machine Company, Hyde Park, Mass. They were particularly designed to machine small parts made in large quantities, such as are used in small arms, typewriters, sewing machines and electrical machinery and apparatus. In the construction of the new models special attention has been given to making the feed works strong enough to transmit the full power of the driving belt and withstand the rough usage to which these machines are subjected. This new feed is driven by belts from the spindle of the machine, through a train of gears so arranged that the velocity of the belt is sufficient to drive all feeds that the main belt will allow. The changes of feed are obtained by four-step cones and by interchanging the feed driving pulleys on the back of the machine, the available combinations giving eight changes from 0.007 to 0.1 in. per revolution of the spindle.

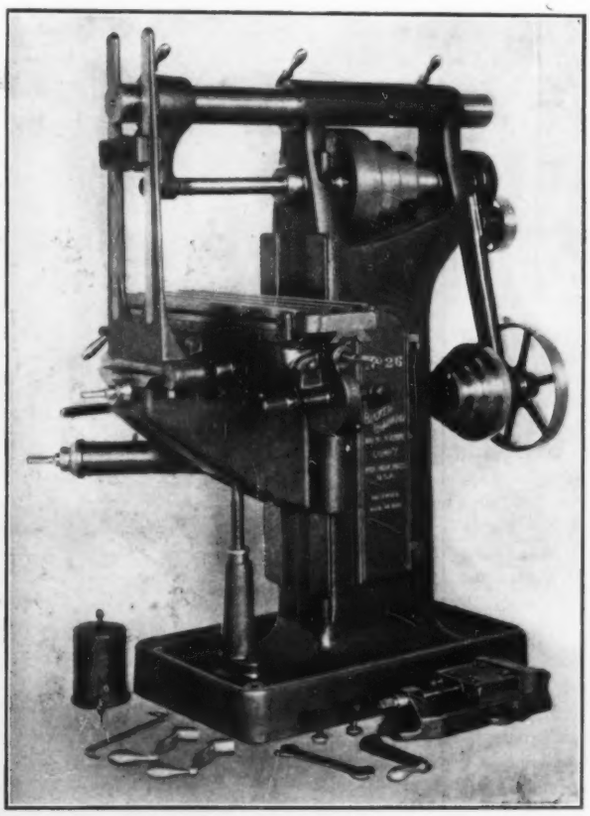
The table is operated by a worm and hobbed rack, the worm being driven by a worm gear of large size and worm of coarse pitch and correspondingly high efficiency. For disengaging the feed a new and novel drop worm mechanism is used, by which the worm is thrown out of mesh with the gear and leaves in a path at right angles with its axis, overcoming the fault of the old style gravity drop worm of clinging to the gear by friction alone. It also equalizes the wear on the worm gear teeth. The worm is engaged and thrown out of mesh by the same lever. All in all, it is a neat, convenient and positive means of automatically disengaging the feed and stopping the travel of the table at a predetermined point. The table is also supplied with a hand quick return of 4 to 1 ratio.

The knee of the new model has been lengthened sufficiently, so that when using a harness brace for supporting the outer end of the arbor there is still left a cross range for the table equal to that of the old style machines This harness is especially commendable in that it contributes to convenience as well as rapidity. It consists of a brace which is gibbed to the knee slide and a clamp that is fastened to the arbor supporting the yoke, so that it may be swiveled around its centers, allowing the brace to be removed without removing any bolts. This clamp is made fast to the brace by friction, which gives a more rigid hold than the old style bolt washer and slot arrangement, and affords a much stiffer support. The arm, which is a solid steel bar, is adjustable lengthwise.

These machines are equipped with a rigid box knee and with a telescopic elevating screw, hence the machine may be set in any position without regard to the beams in the floor construction, as the screw does not project below the floor line. The base of these new machines has been designed on the same lines as the other Becker-Brainard machines, and is extra heavy to absorb vibration. The spindle cone and back gears are of the company's standard design, the spindle bearing being cylindrical in form and the wear taken up by concentric compensating bronze boxes.

As all new patterns were made for these machines, it has been possible to consider their appearance and give them symmetrical outlines.





The Nos. 25 and 26 Plain Horizontal Milling Machines Built by the Becker-Brainard Milling Machine Company, Hyde Park, Mass.

The New England Iron League enjoyed an outing on Friday and Saturday last, which started with a dinner at the Boston Yacht Club, on Friday afternoon. In the evening the party left Boston on the steamship Governor Dingley for Portland, Me. At Cushing's, on Saturday morning, a baseball game was played between the fat men and lean men. In the afternoon a special steamer was taken for an afternoon sail among the islands of Casco Bay. In the evening a special car conveyed the party from Portland to Boston. A feature of this occasion was the printed programme, which was patterned after the ordinary advertising wall hanger. The programme occupied the center of the hanger, while quaintly worded advertising cards formed the margin. The whole arrangement was of the most humorous character.

The Hamburg-American steamer President Lincoln, of 11,233 tons net and 17,540 tons gross, which has just reached New York on her maiden trip, is the first six-masted steamer since the famous Great Eastern to come into the harbor.

Powerful Renold Silent Chain Drives.

Two rather remarkable applications of Renold silent chain drives for high speed power transmission have recently been made under different conditions and in widely separated parts of the country. To the Seattle Brewing & Malting Company, Seattle, Wash., belongs the distinction of installing the largest silent chain drive in this country—a 325-hp. parallel transmission to refrigerating machinery; and under the supervision of William M. Piatt, assistant city engineer, Columbia, S. C., a single strand Renold silent chain drive has been put in to operate a Worthington centrifugal pump from a horizontal turbine at a speed of 1755 ft. per minute. The two chains for the brewing company are run side by side on single wheels 14 ft. from center to center, the load being uniformly distributed by Dodge spring centers on the driven wheel. The speed is 1100 ft. a minute. The pump drive measures 11 ft. 7 in. center to center, and has a capacity of 225 hp.

A Renold silent gear, as it is termed by the American manufacturer, the Link-Belt Company, Nicetown, Philadelphia, Pa., consists of the silent chain and specially cut sprocket wheels. The links, stamped from high carbon steel, are held together by hardened steel pins and bushings, which provide the maximum bearing surface for a given width of chain. It is due to the peculiar formation of the links and their method of contact with the wheels that quiet running is obtained, and the stretch that may result from wear is compensated for. It is claimed the chain will run equally well in either direction and that it is not adversely affected by heat or cold, or damp or oily situations.

Owing to the difficulties which have been experienced by the contractors and construction companies of San Francisco in securing prompt delivery of steel bars for reinforced concrete structures, it will be of interest to the trade in that locality to know that Henshaw, Bulkley & Co., San Francisco, will, in the future, carry from 200 to 300 tons of all sizes of twisted and plain steel bars in stock at their warehouse. The firm recently contracted with the Rogers-Shear Company, Warren, Pa., for a large portion of the output of its Franklin Mill, so that shipments will go forward to San Francisco each week.

New Henry & Wright Sensitive Drills.

Several important improvements are contained in the new model sensitive drill presses made by the Henry & Wright Mfg. Company, Hartford, Conn., notable among them being an entirely new spindle pulley construction, and a change in the idler adjustment. The new machines are built in from one to eight-spindle sizes (an example of the latter is given in Fig. 1) and with different distances from the centers of the spindles to the faces of the pillars to drill to the center of 14, 19, 24 or 30-in. circles respectively.

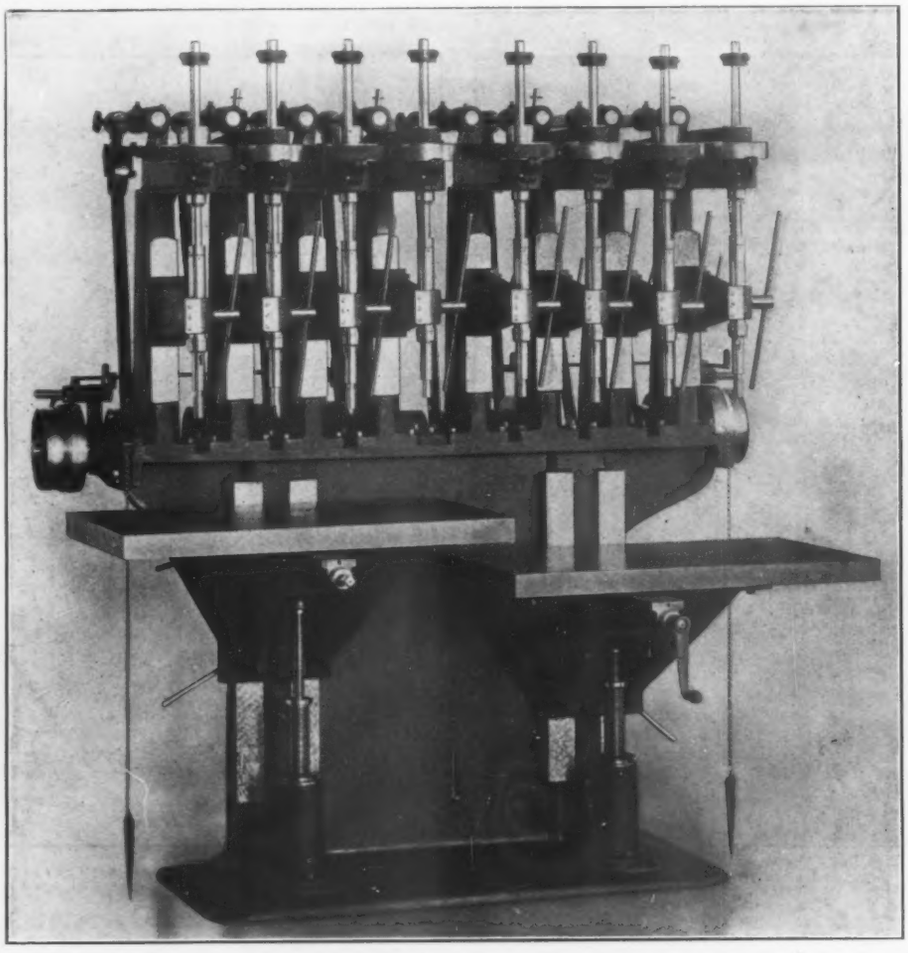


Fig. 1.—An Eight-Spindle Sensitive Drill of the New Model Now Built by the Henry & Wright Mfg. Company, Hartford, Conn.

In the new spindle pulley the hub is made extra long and the ball cases are constructed in one piece, as shown in Figs. 2 and 3. In making the latter the cylinder is first bored from a solid bar and a ball race is turned in each end, insuring perfect alignment and confining the wear to the ball cases and the cones exclusively. When the pulley is assembled with drive blocks, ball cases, cones and balls, it may be handled as a unit and may be placed in position in the pillar or removed at will by adjusting two screws in the pillar head. This drive is almost noiseless and frictionless and promises indefinite wear with proper use.

The idler used to raise or lower the belt to the desired step on the spindle pulley is operated by a bayonet catch which is simpler than the hand screw formerly employed, and makes it impossible to adjust the belt half way. A new form of shipper brings the handle as near as prac-

ticable to the operator and on multiple spindle drills is operated by handles at both sides of the machine. The pillars have been enlarged in the new models and admit heavier weights to accelerate the return of the spindles. The weight of the castings throughout the machines has been increased to give greater rigidity, and all spindles are furnished with 1⅛-in. noses to give them strength sufficient to use large drills.

The eight spindle machine shown in Fig. 1 is prac-

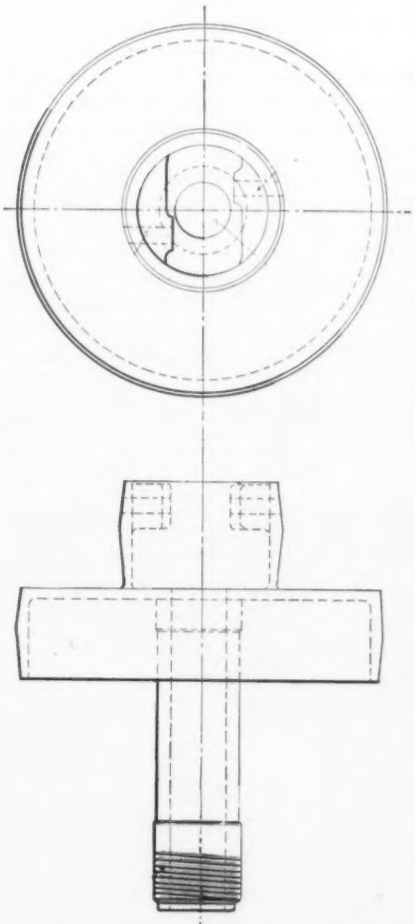


Fig. 2.—Detail of the New Spindle Pulley.

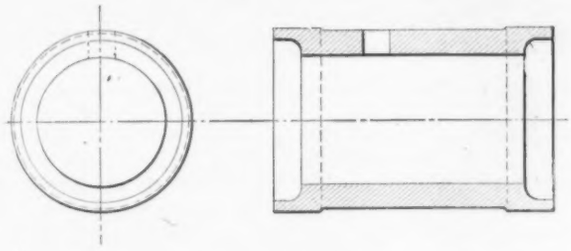


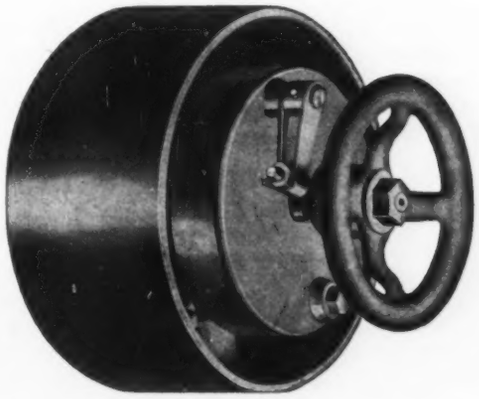
Fig. 3.—The One-Piece Ball Case Used in the New Henry & Wright Sensitive Drills.

tically two four-spindle machines combined on one base which is made in box form for the sake of rigidity. There are two tables instead of one, as in the other sizes, and both are furnished with heavy telescopic screws for raising and lowering. The two tables enable the operator to handle irregular shaped jigs or work and support them squarely by adjusting the tables to different heights. The machine is also provided with a separate tight and loose pulley for each set of four spindles, so that the one side may be adjusted for tapping and the other for drilling. A small two-piece pulley is furnished when desired, to be clamped to the rear shaft, fitting under the small diameter of the driving pulley, to reduce the drilling speed sufficiently for tapping.

Witherbee, Sherman & Co. of Port Henry, N. Y., and No. 2 Rector street, New York City, have been appointed sales agents for the Cheever Iron Ore Company.

The Burtt Friction Clutch.

The friction clutch shown is especially adapted for securing to the end of the crank shaft of a gasoline engine, or other source of power, and is used without a floor stand or other support than the shaft. Only a very slight change is necessary to fit the clutch to any style of flange or shaft. The pulley can be made of any size or face needed, and is cast solid with the friction band, no set screws or keys being used, which makes it lighter and stronger. The extension hub from the friction drum



The Friction Clutch Made by the Burtt Mfg. Company, Kalamazoo, Mich.

over which the pulley is directly placed is brass bushed, or not, as required.

The clutch proper operates entirely by friction secured by the gripping of a friction ring to the friction drum. The ring hangs freely inside of a cast iron drum, and both contact surfaces are finished. The ring runs in oil in a dust-proof case, and is expanded by slightly rotating a ⅞ in. square block by forcing a cone which is loose on the shaft under a lever, which is pinned solid to this square block. The amount of friction can be regulated by an adjusting screw which is threaded into the lower end of the lever, and the required adjustment is fixed by a lock nut. The end of the screw carries a roller which rides up on the incline of the expanding cone. The sizes carried in stock are 6 in. in diameter by 4½ in. face, and 8, 10, 12, 14 and 16 in. in diameter by 6 in. face.

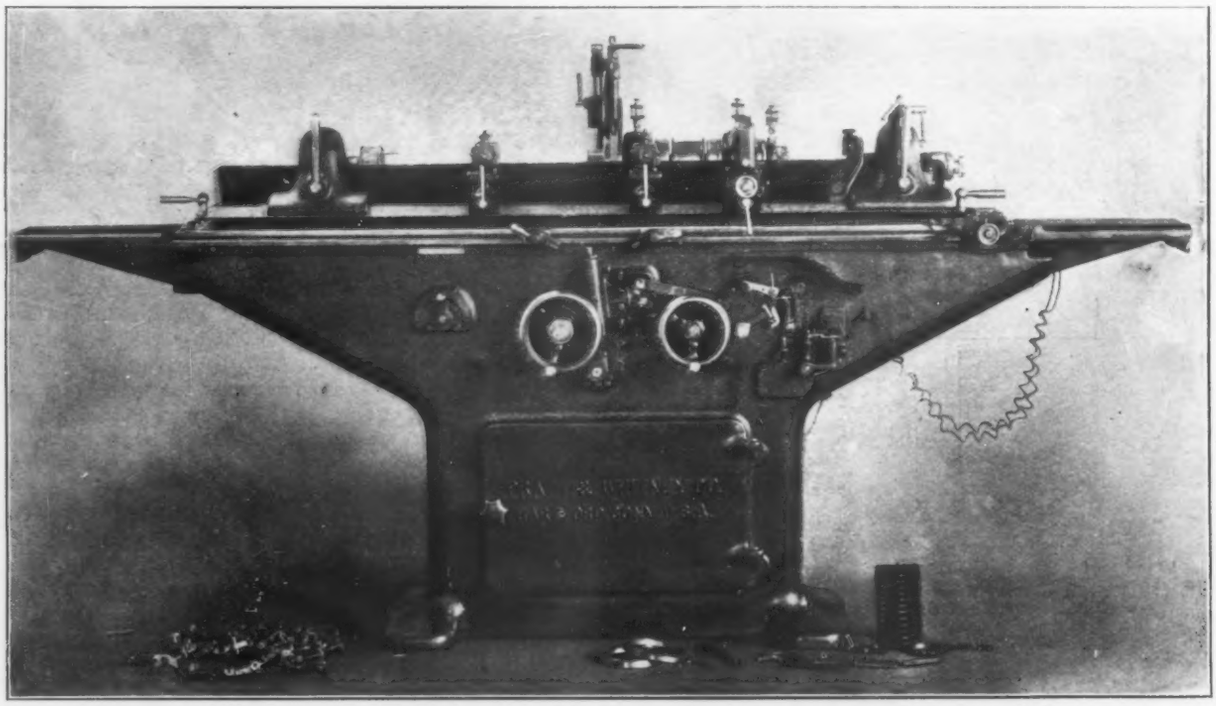
After the great San Francisco fire hundreds of tons of lead, zinc and other metals, owned by the Selby Smelting Company, were found melted into a solid block, at the base of the shot tower that was for many years one of the landmarks of the city. The problem of recovering the metals, which were worth some hundreds of thousands of dollars, was a difficult one. The bed of metal was 3 to 4 ft. thick, and covered the entire area of the ruins of the tower. The great mass could not be raised, or broken into sizes practicable to handle by ordinary means. After removing several tons of brick and débris, however, channels were cut through the great block of metal by the electric arc. The heat and light produced were intense, although a pressure of only 10 volts was employed for each implement. The men engaged in cutting the channels had to protect their faces and hands from the radiation, and their eyes from the blinding light by canvas hoods containing smoked glass. The metal was recovered in blocks of about a ton each.

The Lewis Foundry & Machine Company, Groveton, Pa., has some large contracts on its books, among which is one for the Joliet Iron Products Company, Joliet, Ill., for a 22 and a 12-in. train, with squeezers, roll lathe, shears and saws; for the Duquesne Steel Works of the Carnegie Steel Company, Duquesne, Pa., two angle shears; Carpenter Steel Company, Reading, Pa., two sheet bar shears; for the Calumet Steel Company, Chicago Heights, Ill., 14-in. train of seven stands, three-high bottom screw housings with four shears.

Pratt & Whitney Automatic Grinding Machine.

With a view to making it possible to intrust accurate grinding to the hands of unskilled labor, the Pratt & Whitney Company, Hartford, Conn., has developed the automatic grinding machine herewith illustrated. Duplicate grinding after the machine is set for the first piece of work is simply a matter of removing a finished piece and inserting a new one, and uniform accuracy will be obtained.

The means for insuring accurate duplication is interesting. An arm which rests upon the work being ground is set with a micrometer screw to make two successive electric contacts when the work is nearly and entirely ground to required size. The size of the emery wheel or the amount it may wear has no effect, since the machine will keep on feeding until the electric contracts are made. At the first contact the coarse feed is reduced to a fine one, and at the second contact feeding ceases entirely. As a consequence the work can be reduced very rapidly, as the initial feed can be made all that the work will stand until nearly to size, and the subsequent fine feed will give the work a smooth finish and exact size. If it is desired to grind only one or two pieces, and it is not considered expedient to use the sizing device, the machine can be operated the same as any grinder with mechanical feed.



The Automatic Grinding Machine with Electric Limit Gauge Built by the Pratt & Whitney Company, Hartford, Conn.

The emery wheel is carried on a hardened and ground tool steel spindle, running in adjustable self-aligning bronze boxes, mounted on a very heavy cross slide to absorb vibration. The weight is concentrated on the slide to hold the slide firmly against the feed screw, and so prevent the wheel from feeding forward except through the screw. The traverse of the table is obtained through rack and pinion and the reversing mechanism with positive hardened clutches. The machine, it is claimed, will reverse to within 0.001 in., making it possible to grind close to a shoulder.

It is often important in operating a grinding machine to change the traverse speed of the table, and since this is inconvenient when a cone pulley is used for changing the speed, the operator frequently will not make the change. On this grinder a feed changing mechanism is provided that gives three feeds, changeable while the machine is in operation, by manipulating a crank handle on the front of the machine. For grinding tapers a micrometer adjustment is provided, and so graduated that a person who understands the reading of a common micrometer can use the same reading for tapers. For example, if a taper ⅛ in. per foot is desired, the micrometer will be turned 125 graduations, or .125 in.

Consideration has been given to excellence of construction in the general features of the machine. The column is cast in one piece, is exceptionally heavy, and rests on three points; all gearing and bearings are well protected from dust, yet easily accessible; the head and foot block are of very heavy construction, and the pulley for driving the work is dust proof. Two back rests of improved type are provided, and a new water pump with which idlers for guiding the belt are unnecessary.

Smoke Prevention Convention.—The second annual convention of the International Association for the Prevention of Smoke was held in Milwaukee, June 26, 27, 28, and was attended by smoke inspectors from practically all of the cities in the United States which have made the regulation of smoke conditions a feature of their municipal government. Many representatives of stoker manufacturing concerns were in attendance. An especially prepared paper on "Boiler Room Economy" was read by Paul Chamberlain, chief engineer of the Under-Feed Stoker Company, Chicago, illustrated with stereopticon views. Charles Poethke of Milwaukee was elected president for the coming year, and R. C. Harris of Toronto, Canada, was re-elected secretary-treasurer. It was decided to hold the 1908 convention in Cleveland, Ohio.

Experiments of the Boston Elevated Railway Company with gas engine driven dynamos are said to have been quite successful. One station of 700 kw. capacity was fitted with a producer plant, and from a four months' test under service conditions the coal consumption per kilowatt-hour was found to be but 1.45 lb. on an engine load factor of about 74 per cent. During a 30 days' test, when the plant was running 16 hr. per day on Pocahontas coal, this average fell to 1.31 lb. per kilowatt-hour. Taking these facts at their face value they represent a fuel economy corresponding with that of a steam plant giving a kilowatt-hour on about 12 lb. of steam, an extremely unusual performance.

The problem of keeping railroad equipment in repair, especially where it is required to come up to the highest standard at all times, is demonstrated in the fact that in 1906 it required 207,606 new steel wheels for Pennsylvania Railroad cars and locomotives; 21,843 new steel axles, and 6638 new steel tires.

The Robertson Universal No. 21 Drill Press.

One of the principal features of the drill press illustrated is the universal table, which makes it possible to drill holes at different angles in the same piece without reclamping the work. The table can be quickly shifted to any angle from 0 to 90 degrees. The machine is capable of drilling to the center of a 21-in. circle, from which fact, and also that it has a tilting table, it is designated as the universal No. 21 drill press, by its builder, the Robertson Mfg. Company, Buffalo, N. Y. The company was led to incorporate the tilting table in a complete line of drill presses because of its demonstrated value in connection with certain work in the company's own plant, for which it was originally designed.

The knee on the column is raised by a crank fitted to a steel shaft, on the end of which is a pinion milled from the solid, this pinion meshing a rack on the column, which also is of steel, with the teeth cut from the solid bar. On the outer end of the knee the head for the universal table is turned and faced, having a rebore on its flange that also has a hole or bearing 2¾ in. in diameter, 4½ in. long, to receive the stem of the outer half of the head which supports the table. To make the table doubly rigid there is a lip on the face of the flange in the head that fits the rebore in the knee to bind both faces together. A stud and nut is used for one clamping and a split bearing with lugs and clamp screw for the other. When the table is horizontal or at 45 or 90 degrees a square lock bolt is used to fix its position.

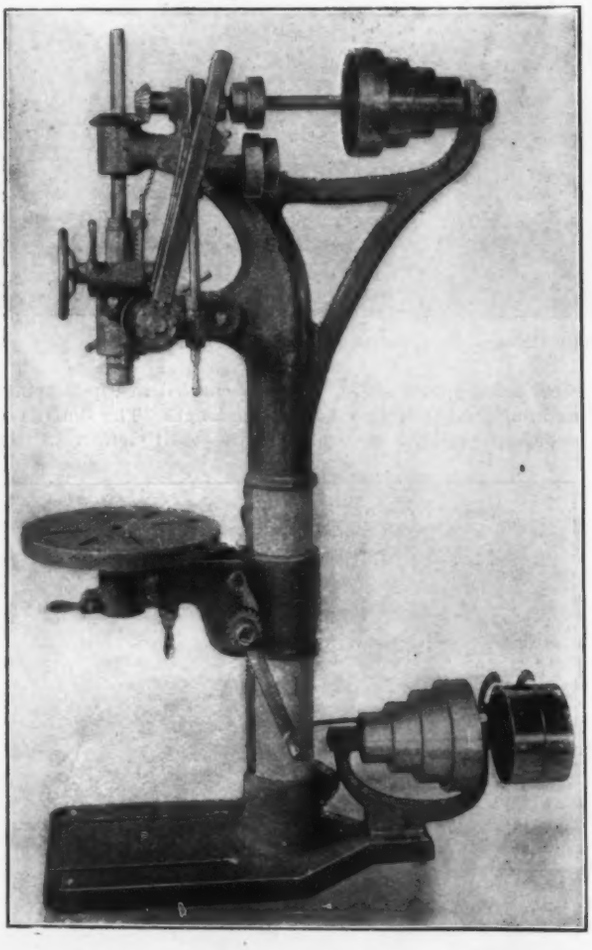


Fig. 1.—The Universal No. 21 Drill Press Built by the Robertson Mfg. Company, Buffalo, N. Y.

This machine is furnished with universal table or solid knee, with lever feed, with wheel and lever, or with wheel and lever and quick return, and with or without power feed and automatic stop, and with or without back gears. The bevel gears entering into the machine are planed from solid metal and are protected with covers. All gears are cut from the solid and of material best adapted to give long wear and service. The spindle is of special carbon steel, well fitted and supported in the sleeve by nuts with fibre thrust collars. The hole is a Morse No. 3 taper. By moving a lever, conveniently located to the operator, any change in combination can be had. The column is heavy and is secured to the base by a clamping bolt. The base is provided with T-slots and foot belt shift for starting and stopping. The machine is designed for hard service and all parts are interchangeable.

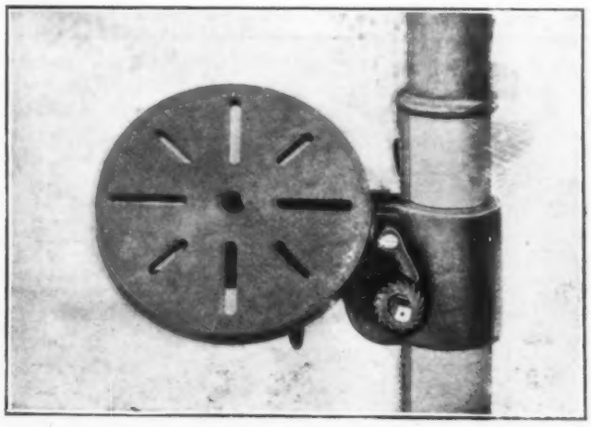


Fig. 2.—The Universal Table of the Robertson Drill in Tilted Position.

Valve Abuses.

In discussing the abuses to which valves are subjected, a writer in the *Valve World* states that at least 90 per cent. of the trouble with those delivering water or steam arises from the improper use of cement, and from a failure to remove the particles of cement, scale, chips, dirt, &c., which get into the pipe while it is lying around a building and lodge on the valve seat after steam or water is turned on. Cement should be applied on the male part only, for if placed on the female part it is likely to go through the pipe and land on the valve seat. Besides this, in nearly all cases more cement is used than is necessary.

Frequently, when a valve leaks, which is usually due to the presence of dirt in it, some one tries to tighten it by using a lever on the wheel. This nearly always injures the valve. It is much better to take the valve apart and clean the seat. Similarly, when a stuffing box leaks, attempts are often made to stop the leak by straining the stuffing box with a large wrench, when the real trouble is that the packing has become worn and needs renewing.

One of the common abuses is the use of a wrench on the opposite end of the valve from that which is being screwed on the pipe. This is particularly bad with light valves, as it is almost certain to spring them and cause them to leak. Again, with light valves, when placing them in a vise to remove the center piece, the valve should always be clamped lengthwise. In removing the center piece care should be taken to have the disk some distance from the seat; otherwise it will be forced down upon the seat and some part will become strained. Another trouble likely to occur in a line containing light valves results from failure to make proper allowance for expansion. The pipes and fittings are much more solid and rigid than the lighter brass valves, and the expansion strains will mainly affect the latter, unless proper allowance is made.

The National Metal Trades Association is in its new quarters at 1001 to 1005 Fourth National Bank Building, Cincinnati, where a fine suite of offices has been secured. The Executive Committee of the Administrative Council will hold its next meeting at Boston July 12, and it is likely that Acting Commissioner Wuest will be elected to serve as the successor of W. P. Eagan, deceased.

A Niles 15-Ton Gantry Crane.

The South Chicago Works of the Illinois Steel Company has lately installed a large Niles electric traveling gantry crane, built by the crane department of the Niles-Bement-Pond Company of New York. The accompanying engravings give some idea of its massive construction, Fig. 1 being a general view of the crane from the side and Fig. 2 an end view. The crane is of 15 tons capacity, and runs on a track laid on the ground with the rails 56 ft. from center to center. A cantilever extension on one end 12 ft. 9 in. long and one on the opposite end 28 ft. 3 in. long make the total length of the crane girders 97 ft.

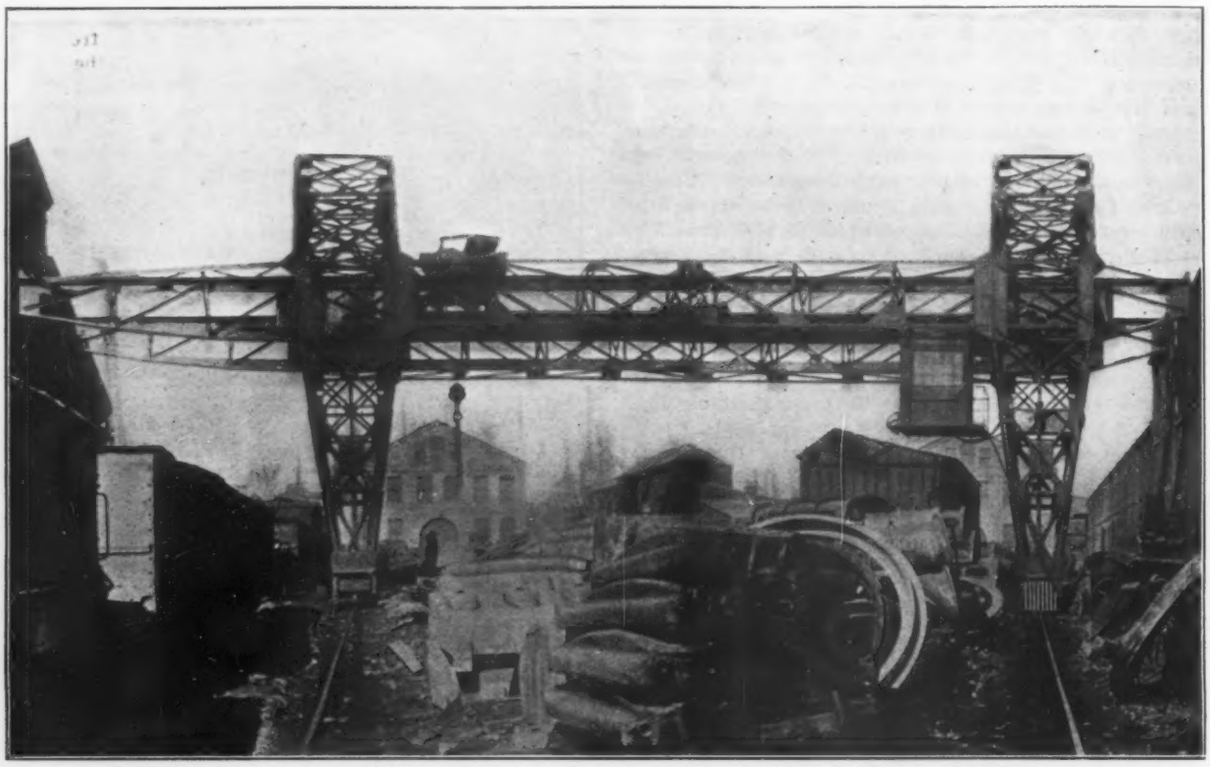


Fig. 1.—The Niles 15-Ton Gantry Crane at the South Chicago Works of the Illinois Steel Company.

This crane is of an especially convenient design for yard service, the cantilever extension on one end being long enough to cover a single track and that on the opposite end two tracks. The entire space between the runway tracks is available for storage purposes, and the travel of the crane is limited only by the length of the storage yards and tracks. A load of 15 tons can be lifted and transported to or from a car on any of the three tracks mentioned, or from the storage space between the supporting columns.

The girders are of what might be termed lattice construction, with auxiliary bracing. The main girders are built up with universal mill plates and angles to form the top and bottom chords, fastened together by lattice angles. The auxiliary girders are of lattice construction, so arranged as to secure great strength and rigidity and minimum surface to wind resistance, which is important in yard cranes exposed to the elements.

The girders are supported on structural steel pillars or A-frames of the same construction as the bridges. These A-frames extend above the girders, where they are held together, allowing sufficient space beneath for the passage of the trolley, which is free to traverse the entire length of the crane. The supporting columns of each frame are connected together at their lower ends by substantial bridge trucks, each truck carrying four double flanged truck wheels, mounted in pairs, with equalizing connections to the bridge truck, so as to compensate for irregularity in the runway tracks. Two of these equalizing truck wheels on each bridge end are connected by spur gears and pinions. The truck axles are of steel, turned and ground, and revolve in bronze bearings, with waste cellars beneath. The truck wheels are forced on their axles by hydraulic pressure, and are further secured by keys. At each end the bridge trucks are equipped with pilots to remove any obstruction from the track.

The bridge drive motor is located on the girders approximately in the center between the runway tracks, where it is connected by a spur gear and pinion to the steel bridge drive shaft, which is carried in cap bearings and uniformly supported its entire length. The shaft is of sufficient strength to transmit the entire effort of the motor and to skid the wheels on the track. The motor has a powerful foot brake of the Post type, in which the brake shoes are withheld from contact with the brake drum except when applied by the operator, thereby elimi-

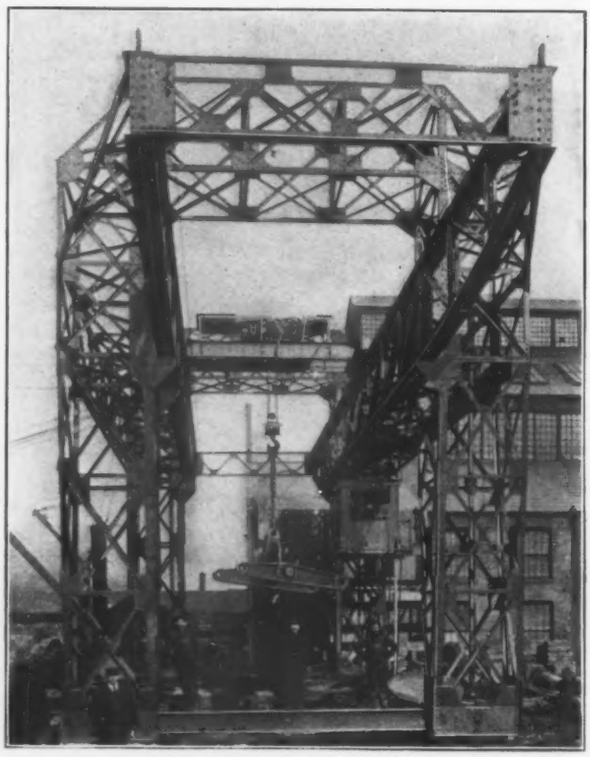


Fig. 2.—End View of the Crane.

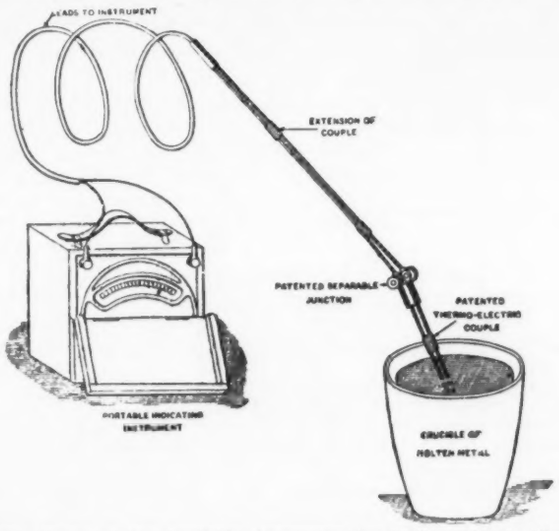
nating friction and reducing wear on the brake shoes and drum. This brake is operated by a foot lever located conveniently in the cage.

The operator's cage is inclosed and is fitted with drop windows and sliding door. A steel ladder attached to one of the supporting columns reaches from the ground to a platform on the floor level of the cage, from which access is had to the cage through the sliding door. The platform is surrounded by a hand rail and has a second ladder leading to the foot walk extending the length of the bridge drive shaft, allowing easy access to all gears and bearings.

The trolley is of steel and so designed as to avoid overhung gears. Its truck axles also revolve in bronze bearings, having cellars beneath for waste saturated with oil. The hoisting mechanism is equipped with both electric motor and mechanical load brakes, running in an oil bath. All gears throughout the crane are cut from solid steel castings, and the pinions from open hearth steel forgings. The hoisting speed is 30 ft. per minute when lifting a load of 15 tons, the trolleying speed 150 ft. per minute and bridge traveling speed 250 ft. per minute under the same conditions. The entire trolley is inclosed to protect it from the weather, and the cover being fitted with hinged doors all parts are readily accessible for examination or repairs.

The W. H. Bristol Portable Pyrometer for Molten Metals.

In making castings from molten metals and alloys it is often of great importance to know the temperatures of the metals, that they may be mixed, alloyed and poured at the proper ones to obtain the best results. A special form of pyrometer for practical shop use in



The Parts of the Portable Pyrometer for Molten Metals Made by Wm H. Bristol, New York.

such work has been designed by Wm. H. Bristol, 45 Vesey street, New York city, inventor of the low resistance thermo-electric pyrometer described in *The Iron Age*, May 17, 1906. The portable indicating instrument may be carried by hand from place to place and the temperature of a molten metal taken within two or three seconds. The possibilities and value of an instrument of this kind will be appreciated by those interested in foundry work.

The outfit complete consists of a portable indicating instrument connected to a special thermo-electric couple, the two elements of which are disconnected and left without insulation. When the tips of these elements are slightly immersed into the molten metal an electric connection is made and the reading on the instrument will be the same as if the couple had been originally joined. The advantage of this plan is that the tips of the wires forming the elements almost instantly assume the temperature of the molten metal and the time lag error is eliminated. The general arrangement of the parts forming the outfit is shown in the accompanying diagram as it would be applied for taking the temperature of a crucible of molten metal just before pouring.

This form of couple has been successfully applied in measuring the temperature of molten metals, such as cast iron, copper, aluminum, brass, bronze and other alloys. When the tip of the couple becomes worn away by continued use, a fresh portion is exposed to the molten metal and the reading will be the same if the couple has not been very materially reduced. A separable junction is provided, as shown in the diagram, so that fresh tips can be conveniently applied before enough of the couple has worn away to appreciably affect the resistance and cause an erroneous indication on the instrument.

The Lukens Manhole Cover.

Boilermakers, engineers and those who have sought a manhole cover which will not leak and which can be drawn up tightly against the face of the manhole open-

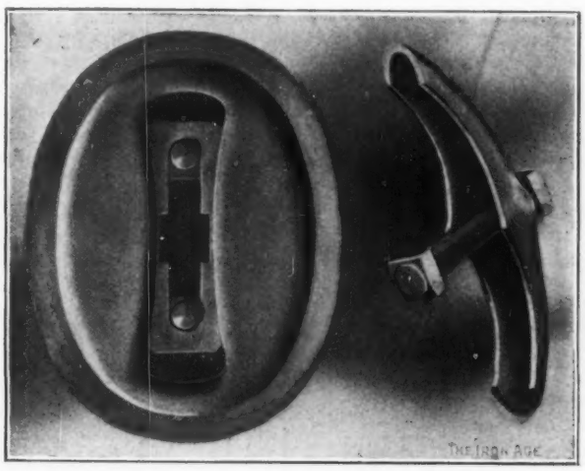


Fig. 1.—The Lukens Manhole Cover and One of the Clamping Yokes and Bolts.

ing flange without excessive pressure will be interested in a new one which has been brought out by the Lukens Iron & Steel Company, Coatesville, Pa. The construction is so clearly indicated in the illustrations that it needs no description. Fig. 1 shows a view of the cover from the outside and one of the two bolts and yokes which are used to secure it in position. Fig. 2 is a cross section through a cover when secured in the manhole opening.

Among the advantages to be noted are that it is very strong for its weight; that it is easily removed and replaced, and that it has no through holes for the bolts, to offer additional opportunity for leakage. The use of two bolts and yokes insures a uniform fit at the ends and sides without a very great clamping pressure, and for that reason is better than using only one bolt. The

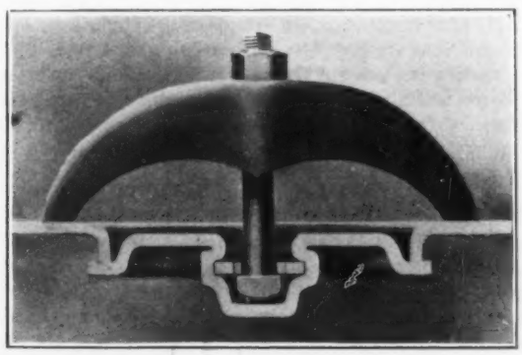
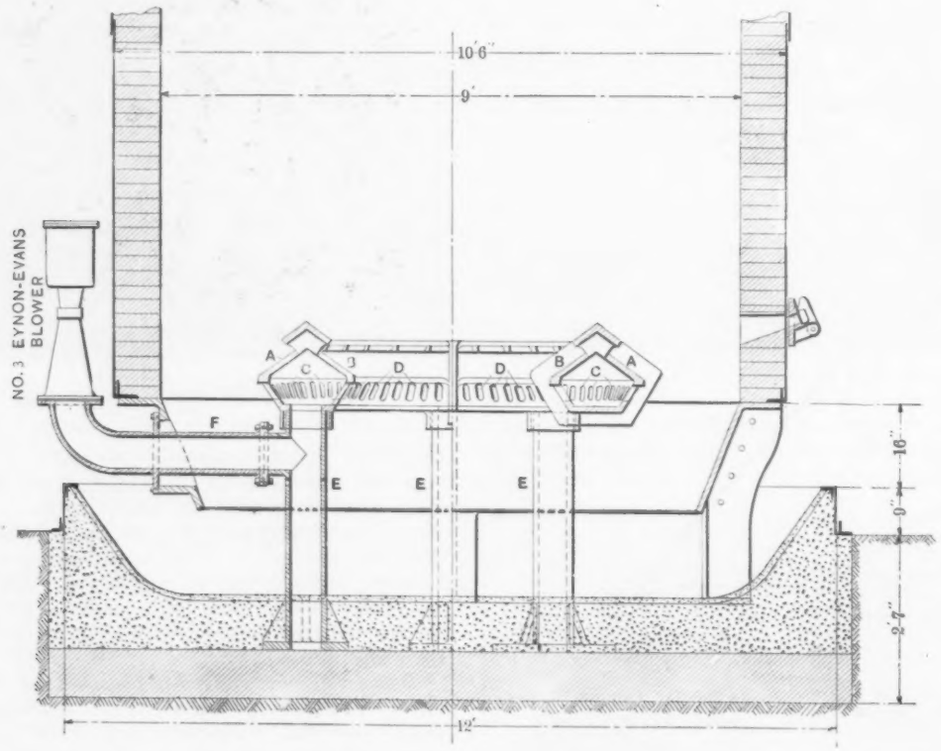


Fig. 2.—Section of a Lukens Manhole Cover Applied.

bolts are ordinary stock bolts, no fitting of the bolt head being required, which is an especially important consideration, as in an emergency any blacksmith can replace a broken bolt. The method of holding the bolts in place is unique, simple and effective and precludes any chance of their falling out when the cover is being placed in position.

A Device for Uniform Blast in Gas Producers.

William R. Miller of the Forter-Miller Engineering Company, Pittsburgh, has recently devised an improvement upon the gas producer of that company calculated to give uniform distribution of the steam and air blast through the entire area of the fuel bed. At the same time it facilitates the free downward movement of the ashes into the pan. The view given is of the lower portion of a Forter-Miller producer, which is equipped in the usual way with a water seal basin, in which the ashes accumulate. The recent improvement consists in the provision of a windbox, consisting of a hollow ring concentrically located and of triangular cross section through one side. The outwardly and inwardly sloping faces A and B are so arranged that the ashes pass down and to the outside and inside of the wind box. The latter is composed of a number of sections bolted together through flanges, and the slanting walls A and B have interlocking joints, so that the series of sections are rigidly connected. The ports through which the air and steam



Device for Uniform Blast in Gas Furnaces.

are supplied to the fuel are shown at C and D. The windbox is supported on standards, E, made of hollow pipe, and the supply pipe F connects with a blower. The gas maker can control the supply of air and steam, so as to force more or less air to the grate, according to the nature of the fuel or the quality of gas required.

Where the producers are of large diameter a number of concentric circular windboxes may be utilized.

The Freeman Foundry & Mfg. Company, Joplin, Mo., has been purchased by the United Iron Works Company, Springfield, Mo., and will be added to the line of plants under its control, which are now eight in number. The Freeman plant is one of the largest foundry, boiler, forge and machine shops in southwestern Missouri, and has made a specialty of mining machinery.

The Brier Hill Coal & Coke Company, a subsidiary interest of the Brier Hill Coal & Iron Company, Youngstown, Ohio, has elected H. H. Stambaugh president; R. C. Steese, vice-president; George Tod, treasurer; Thomas McCaffery, secretary and manager. This company is now operating 420 coke ovens in the Connellsville region.

Marine Boiler Design.

In discussing the requirements of water tube boilers a recent issue of the *Technology Quarterly* laid down a few rules for boilers designed for general service at sea. The boiler should have such combustion space, heating surface, water circulation and baffling as will give it high efficiency at its usual rate of steaming with, in warships, no serious reduction in that efficiency at the limit of reasonable forcing. This limit, under service conditions in the United States Navy, appears to be a consumption of about 40 lb. of coal per hour per square foot of grate.

For sustained efficiency the tubes should be so arranged that both sides of the heating surface can be kept cleaned. In spite of all precautions some scale is bound to be deposited, owing to leaky condensers, defective valves or an occasional unauthorized dose of salt feed when low water is feared. It is also impossible to keep the tubes entirely free from oil, which, even though there be no lubrication of the main engine cylinders, will enter through the exhaust from pumps or dynamos. For these reasons the interior of the tubes should be readily accessible, both for inspection and the use of scaling cutters; and ample means should be provided for blowing the soot from their exterior while under way and for thoroughly cleaning the boiler when out of use.

The boiler should be capable of assembling in the form of single units of large power. A large number of small boilers means much added complication in piping, valves, fittings and pumps, with a corresponding increase in the cost of maintenance in operation. The division of the heating surface into a number of similar elements, each independent in action and fitting of the others, is an advantage of much importance in obviating all strains due to unequal expansion and contraction, and in making possible the erection of the boiler in sections on the vessel, thus avoiding cutting the decks when installing new boilers.

Weight saving in both boiler and contained water is an inherent advantage of the water tube boiler. This should not, however, be pressed to extremes in boilers designed for general service. It is false economy to limit the area and thickness of the heating surface in the interests of weight saving, or to have so small a volume of contained water that unceasing vigilance is necessary.

Mesaba Range Explorations.

DULUTH, MINN., June 30, 1907.—Although the Mesaba Range has been pretty thoroughly prospected and it has been generally believed that all the important ore deposits have been discovered, more drills are now working than at any time in the past. One of the most difficult matters in connection with exploration operations on this range—and on others as well—is securing drills and drill runners, especially the latter. Men capable of operating drills with skill and economy are exceedingly difficult to secure.

Much of the newer work is in Itasca County, west of the Mississippi River, and explorers are working clear over into Cass County, though as yet little of value has been found there. Once the general strike of the range through these counties is ascertained definitely, it is possible that large tonnages of medium and low grade ores will be opened there. The trouble with explorations in these counties has been that the Mesaba, as it passes west of the Mississippi River, drops beneath a covering of drift, thicker as one proceeds west, and there are no indications on the surface to show where the formation extends. Exploration, therefore, must be a blind search for the strike of the range, which, once accurately determined, can be followed as one feels along in the dark. This is necessarily slow and costly work and a great deal of money is being spent in its prosecution. Were it not for the probability of use of lower grades of ore than have heretofore been considered merchantable, none of this work would be undertaken, for it is generally considered that anything found west of the river will be of the same general nature as the imperfectly concentrated ores of that part of the Mesaba now under development close to the river on the east.

Important Developments.

Probably the most important exploratory development of the year, so far at least, is a find of ore in section 14-57-21, on a State lease, by G. H. Crosby and others. Their blue prints show a very considerable tonnage, estimated by some of them as high as 10,000,000 tons, much of which is fairly good grade non-Bessemer. One interesting fact concerning this exploration is that a drill was driven through 171 ft. of hard taconite and is now 75 ft. in good ore beneath it and still going in ore. This is one of the deeper taconite holes of the range. It is understood that this find of ore is tied up with one of the large steel making concerns. The same explorers are drilling on section 11, just north of 14, and hope to find ore there.

Perhaps the next most important find of recent months is in sections 5 and 6, 58-15, on both sides of Embarras Lake, where Longyear & Bennett have options on several tracts and are developing extensively. On the south side of the lake, in the northwest of the southwest quarter of section 5, one hole has been put down more than 540 ft., and there are about 300 ft. of ore, beginning at 180 ft. down. This ore is of fair grade, averaging about 55 per cent. iron. Other holes do not show so deep a deposit, but look well. On the north side of the lake, in the northeast quarter of section 6, a considerable body of the same ore in being shown, though, as the work is of recent commencement, the development is less forward. In all several million tons have been proved there.

In section 11-58-19, Jennings Brothers of Pittsburgh and John Helmer of Duluth have found about 1,850,000 tons of quite good ore and are preparing to mine it, expectiug to begin operations in about a month. In section 14, same town, and just south of the Helmer find, the Oliver Iron Mining Company has a small new deposit of about 1,000,000 tons. Pickands, Mather & Co. have been working in sections 2, 9, 10 and 11, in 56-23, and are still exploring portions of the tracts. They have some very good and a lot of very poor ore there. In section 16-57-22 the Republic Iron & Steel Company is drilling deep, and has found some encouraging signs of ore bodies, but nothing merchantable as yet. On the east end of the range the St. Clair work, in lands of the old Mesaba Iron Company, under way for nearly a year, has not shown the anticipated results, and it is doubtful if more ore has been found there than has been known to exist for many years. In general, deeper work is carried on now than in the past, and the ground is searched much more carefully, with more holes to the 40 and more care in examining the rock taken up.

On the Cuyuna Range.

Exploration on the Cuyuna range, west of Duluth, is said to be making a better showing than before, and several deals have been closed recently for tracts there. The most important of these was a lease by Rogers, Brown & Co. for a tract in section 29-47-28, near Rabbit Lake, for which they agree to pay at least one year's royalty of 25 cents a ton on 25,000 tons, and on which they will sink a shaft at once. This tract was explored by the Oliver Iron Mining Company last year and abandoned, as the company found nothing of value, but the Orelands Company, owner of the land, did exploratory work later, and states that it has found a width of ore of about 250 ft. running from 55 to 60 per cent. iron and of good depth. The shaft which Rogers, Brown & Co. will soon sink will determine precisely whose explorations were most accurate and well judged. The Oliver holes were inclined and cut ore near the slate hanging walls, but the Orelands Company claims that vertical holes would have shown large bodies, which the inclined holes did not find. Other parties are taking lands on the range, and exploration there will doubtless proceed with as much activity as before.

While this letter has been devoted entirely to operations in Minnesota, it must not be inferred that other ranges along Lake Superior are not looking well and doing their part toward this record breaking year. All of them, especially the Menominee, are making great progress, though it is not probable that any of them will hold up to their former proportions of the year's shipments. Escanaba shipments are ahead of last year, but Marquette is scarcely up. The Michipicoten Range, on the Canada side, operated by the Lake Superior Corporation, is falling behind badly, and while its total shipments cut no figure in the general total, the decrease of not far from 50 per cent. so far this season is significant of what is to be expected from that mine. Probably this diminution in Canadian shipments will be met by the Atikokan District, when that begins to send ore to the general market.

The new Great Northern ore shipping pier, under construction since last fall, is completed and in operation. It is one of the two largest ore piers in the world.

D. E. W.

A Steam Turbine Auxiliary.—The steam turbine is generally regarded a competitor of the reciprocating engine, but a low pressure turbine may be made a very valuable adjunct to its older rival. A large electric station in Edinburgh operates with non-condensing engines. Requirements have made it necessary to increase the capacities 4800 kw. To install noncondensing equipment would have cost $330,000. To change the entire plant, old and new, to condensing, would have cost an additional $220,000. By putting in low pressure turbines to use the exhaust steam, however, thus eliminating the nuisance of the steam in the atmosphere, the additional power was obtained without calling for any more boilers, and at a total cost of $330,000. It also has this great advantage, that no more coal is needed to run the present enlarged plant than was required for the plant previous to the enlargement. This means that the plant as a whole is now operated upon a much lower basis of cost per unit of power developed than was formerly the case; also that the additional power is obtained in return for the interest on $330,000, plus the depreciation on the new portions of the equipment, the fuel bill being unchanged.

On the Pennsylvania Railroad's lines east of Pittsburgh there are required 952 more locomotives than passenger cars to handle the traffic offered, according to the annual report of the general manager just issued. There are in service upon these lines 4099 locomotives and 3147 passenger cars.

First Quinquennial Census of the Iron and Steel Industry.

WASHINGTON, D. C., July 2, 1907.—The Census Bureau has completed the final report upon the iron and steel industry, which will form one of the leading chapters of the Census of Manufactures of 1905. It has been compiled by Story B. Ladd, under the direct supervision of William M. Steuart, chief of the Bureau of Manufactures. The period covered is the calendar year 1904, or the business year of the establishment reporting which most nearly conforms to this and ends before January 1, 1905. In drawing comparisons between the figures of the different censuses it should be borne in mind that the canvass made in 1905 was the first quinquennial census since the establishment of the Government, and that the interval following the enumeration of 1900 was but one-half of that for prior census periods.

A Year of Depression.

In examining the figures contained in this report it should be specially noted that the iron and steel industry in 1904 was seriously affected by the general business depression which began in the first half of 1903 and continued until August and September, 1904. The iron and steel production during the year 1904 was in many lines less than in 1903 and 1902, the increased production resulting from the revival in the fall of the year not being sufficient to offset the losses during the earlier months. On the other hand, each of the prior censuses from 1870 to 1900, inclusive, which is presented in this report in comparison with 1905, was for a year of industrial activity and prosperity, a year of advancement and growth. The census of 1870 was taken for a year of increasing production, the crest of which, measured by pig iron production, was reached in 1873; the crest of the wave of increase of 1880 was reached in 1883; 1890 was at the summit of a period of business activity and growth; and the period of increasing production witnessed in 1900 did not receive a check until 1903. Likewise, the iron and steel production for the calendar year 1905 was abnormally and phenomenally large and the industry uniformly prosperous. The census report therefore presents under cover of 1905, which was an active and prosperous year, the statistics for a year of partial depression and curtailment, in comparison with prior census years of growth and prosperity.

Scope of the Statistics.

The statistics relate only to establishments which operate blast furnaces, steel works and rolling mills, and forges and bloomeries. Establishments manufacturing iron blooms, billets, and hammered bar iron direct from iron ore or from pig iron, scrap iron or steel, are classified as forges and bloomeries only when the products are made for sale and not for consumption in a rolling mill department of the producing plant. In the early years of the iron and steel industry the forges and bloomeries were an important feature, but they have been steadily declining, and at the census of 1905 the few remaining bloomeries are included in the statistics for steel works and rolling mills except when shown separately for comparative purposes with former years.

The blast furnace products include all kinds of pig iron, spiegeleisen, ferromanganese and ferrosilicon, whether cast or used in a molten condition in Bessemer converters, open hearth furnaces, cupolas, &c., and castings made directly from the furnace. The products of steel works and rolling mills embrace steel ingots and direct steel castings and all hot rolled or forged iron or steel. Many mills carry the manufacture of the primary rolling mill products through to more highly finished forms, such as nails, spikes, bolts, nuts and wire, and in some cases products of this kind constitute the bulk of the output of the establishment. In such cases the statistics presented are those of the primary rolling mill products, the enhanced value due to the further manufacture into more highly finished forms being handled as a separate factor. The gross ton (2240 lb.) is used throughout the report except for coke, which is in short or net tons (2000 lb.).

At the census of 1880 the capital and labor employed in mining iron ore and coal, in coke making, quarrying limestone, charcoal burning, &c., were included in the capital invested and labor employed in the production of pig iron where the mines, ovens, quarries or kilns were owned or operated by the blast furnace establishments. The cost of materials reported was nevertheless apparently the cost at the furnace, and hence the figures of cost for 1880 involve a duplication to this extent. The statistics for 1890, 1900 and 1905 for the blast furnace industry relate only to the manufacture of pig iron, and do not, as a rule, include details for any of these related industries.

The following table shows the general statistics for the iron and steel industry as a whole for the census years 1890, 1900 and 1905, only active establishments being included:

	1905.	1900.	1890.
Number of establishments	606	669	719
Capital	$948,689,840	$590,530,484	$414,044,844
Salaried officials, clerks, &c., number	16,566	9,217	4,325
Salaries	$20,758,412	$11,741,788	$6,462,236
Wage-earners, average number	242,740	222,607	171,181
Total wages	$141,439,906	$120,836,338	$89,273,956
Men 16 years and over	239,383	219,635	168,943
Wages	$140,545,610	$120,157,007	$88,840,642
Women 16 years and over	1,455	1,071	58
Wages	$441,967	$266,888	$17,106
Children under 16 years	1,902	1,901	2,180
Wages	$452,329	$412,443	$416,208
Miscellaneous expenses	$47,164,970	$32,274,100	$18,214,948
Cost of materials used	$620,171,881	$522,431,701	$327,272,845
Value of products	$905,854,152	$804,034,918	$478,687,519
Tons of product (2240 lb.)	34,844,933	29,507,800	16,264,478

Output Compared with Population.

In 1870 the United States had a population of 38,558,371, and the iron and steel industry a product of 3,263,585 tons, or an average of 0.0846 of a ton of product per unit of population. In 1880 the iron and steel tonnage per unit of population had increased to 0.1293 of a ton; in 1890 it was 0.2584 of a ton; in 1900, 0.3883 of a ton, and in 1904, on the basis of the estimate of population of continental United States, it was 0.4288 of a ton. Thus the iron and steel industry not only keeps pace with the growth in population, but shows an increase per unit of population during the decade of 1870 to 1880 of 52.8 per cent.; for the decade ending in 1890, of 99.8 per cent.; for the decade ending in 1900, of 50.3 per cent., and for the five years, 1900 to 1905, of 10.7 per cent.

The number of establishments has steadily decreased at each succeeding census, falling from 808, in 1870, to 606 in 1905, while the capital invested has increased nearly sevenfold, and the value of products more than threefold. This shows strikingly the concentration that has marked the development of the industry during this period of 35 years. To a small extent, the decrease in number of establishments in 1905, as compared with 1900, is due to the fact that in a few cases one report was made for two or more plants under the same ownership and within the same municipality, whereas in 1900 separate reports were made for the different plants.

Disproportionate Increase in Capital.

It will be noted that the increase in capital is apparently out of proportion to the growth of the industry in other particulars. The reported capital invested in 1905 exceeds that of 1900 by $358,159,356, or 60.7 per cent.; whereas the increase in wage earners, wages paid, cost of materials and value and quantity of products all fall within a range of from 9 to 19 per cent. This difference is in part explained by the depression in the iron and steel industry prevailing during the early part of the

census year, which restricted production, labor and operating expense. The capital invested in 1870 shows an average per ton of product of $37.31; in 1880 it was $32.36; in 1890, $25.46, and in 1900, $20.01. At the present census the invested capital as reported shows an average of $27.23 per ton of product. Manifestly, if the law of progress deduced from these returns holds true—namely, a steady advance in the earning power of capital from decade to decade through the use of improved appliances and methods—the capital invested per ton of product should, with full production, be less than that of former years, whereas it exceeds that of 1900 and 1890. The large increase in capital is due in part to the fact that, in the case of some of the corporations, the capital reported as invested in land, buildings, machinery, &c., and live capital, is stock capital as carried on their books, this being the only thing possible to report under the circumstances. But in the case of a corporation formed by the aggregation of a number of plants, which have been turned over to the new company for stock considerations, such book accounts necessarily represent more than actual cash investments.

Attention is called to the fact that the number of children employed is substantially the same as in 1900 (except by one), and has not increased with the growth of this industry. In 1890 the average number of children under 16 years employed was 1.3 per cent. of all wage earners; in 1900 they constituted nine-tenths of 1 per cent., and in 1905 they formed eight-tenths of 1 per cent. The 1880 and 1870 figures include children employed in coal mining, &c., in conjunction with blast furnace operations, and hence are not comparable.

Pennsylvania Produces More Than Half.

Pennsylvania, Ohio and Illinois were the leading States in 1905, as well as in 1900 and 1890. Pennsylvania produced 52 per cent. of the value of all iron and steel products in 1905, as against 54 per cent. in 1900, and 55.3 per cent. in 1890; Ohio, 16.9 per cent. in 1905, 17.3 per cent. in 1900, and 13.6 per cent. in 1890, and Illinois, 9.6 per cent. in 1905, 7.5 per cent. in 1900, and 8.1 per cent. in 1890. The next State in rank, New York, produced 3.3 per cent. of the products.

Of the capital invested in the iron and steel industry, Pennsylvania reported 49.8 per cent. in 1905 and 54.5 per cent. in 1900; Ohio, 13.8 per cent. in 1905 and 14.6 per cent. in 1900, and Illinois, 6.2 per cent. in 1905 and 7.3 per cent. in 1900.

Pennsylvania employed 51.4 per cent. of all wage earners in the industry in 1905 and 49.8 per cent. in 1900; Ohio, 13.7 per cent. in 1905 and 15.1 per cent. in 1900, and Illinois, 7.6 per cent. in 1905 and 7.5 per cent. in 1900. In the matter of wages, Pennsylvania contributed 51.7 per cent. of all wages in 1905 and 51.2 per cent. in 1900; Ohio, 15.6 per cent. in 1905 and 16.3 per cent. in 1900; Illinois, 8.1 per cent. in 1905 and 8 per cent. in 1900. In cost of materials used Pennsylvania's share of the total was 52.3 per cent. in 1905, and 54.2 per cent. in 1900; that of Ohio, 17.8 per cent. in 1905 and 17.5 per cent. in 1900, and that of Illinois, 9.3 per cent. in 1905 and 8 per cent. in 1900.

As a combination of the statistics of these three leading States was made in prior reports, a like presentation will be given. The combined capital invested at the census of 1905 was $662,405,541, or 69.8 per cent. of the total capital, compared with $451,819,450, or 76.5 per cent. of the total in 1900; with $298,627,213, or 72.1 per cent. in 1890; and with $131,559,449, or 62.7 per cent. in 1880. The average number of wage earners employed in 1905 was 176,319, or 72.6 per cent. of the total number, compared with 161,183, or 72.4 per cent. in 1900; with 124,704, or 72.8 per cent., in 1890; and with 83,276, or 59.1 per cent., in 1880. The wages paid in 1905 aggregated $106,667,940, or 75.4 per cent. of the total amount, compared with $91,279,590, or 75.5 per cent. in 1900; with $68,033,689, or 76.2 per cent., in 1890; and with $35,869,638, or 64.7 per cent., in 1880. The cost of materials in 1905 aggregated $492,538,582, or 79.4 per cent. of the total, compared with $416 201,353, or 79.7 per cent., in 1900; with $254,811,212, or 77.9 per cent. in 1890; and with $131,242,090, or 68.6 per cent. in 1880. The value of the products aggregated $711,440,729, or 78.5 per cent. of the total in 1905, compared with $633,683,600, or 78.8 per cent. in 1900; with $368,789,503, or 77 per cent., in 1890; and with $201,039,917, or 67.8 per cent., in 1880.

The State of New York ranked fourth in the value of all iron and steel products in 1905, whereas in 1900 it was eighth; Alabama was fifth, instead of sixth as in 1900; New Jersey was sixth, whereas in 1900 it was fourth; West Virginia, seventh (same in 1900); Indiana, eighth (fifth in 1900); Maryland, ninth (eleventh in 1900); Massachusetts, tenth (ninth in 1900); Wisconsin, eleventh (tenth in 1900); Colorado, twelfth; Michigan, thirteenth (fourteenth in 1900); Kentucky, fourteenth (thirteenth in 1900); and Connecticut, fifteenth. None of the other States exceeded $5,000,000 in value of iron and steel products.

An increase in value of products is shown for all States given in detail except for Delaware, Indiana, New Jersey and Virginia. Delaware shows a decrease in products of 49.4 per cent., with a decrease in materials used, wage earners and wages paid, accompanied by a very considerable increase in capital; Indiana shows a decrease in products of 12.5 per cent., and a decrease in cost of materials, wage earners and wages paid, likewise accompanied by an increase in capital; New Jersey shows a decrease of 2.9 per cent. in value of products, with a decrease in cost of materials, and an increase in wage earners, wages paid and capital, and Virginia shows a decrease of 41.7 per cent. in value of products, with a decrease in cost of materials, wage earners, wages paid and capital.

Distribution of Capital.

The distribution of the invested capital between blast furnace establishments, steel works and iron mills and forges and bloomeries for the census years, 1900 and 1905, is shown in the following table:

Blast Furnaces.

	Establishments.	Capital.
1905	191	$239,559,194
1900	224	148,226,113

Steel Works and Rolling Mills.

	Establishments.	Capital.
1905	409	$708,908,534
1900	438	441,795,983

Forges and Bloomeries.

	Establishments.	Capital.
1905	6	$221,112
1900	7	508,388

The capital invested in steel works and rolling mills has increased, as a rule, faster than the capital invested in blast furnaces, the increase of capital in blast furnaces showing a slight relative increase from 1900 to 1905 over that for steel works and rolling mills, while the capital invested in forges and bloomeries has rapidly decreased. Thus from 1880 to 1890 the total capital invested in steel works and rolling mills increased 135 9 per cent.; in blast furnaces, 35.7 per cent., and in forges and bloomeries it decreased 75.5 per cent. From 1890 to 1900 capital of steel works and rolling mills increased 58.3 per cent.; that of blast furnaces, 12.3 per cent., and that of forges and bloomeries decreased 42.4 per cent. From 1900 to 1905 capital of steel works and rolling mills increased 62.3 per cent.; that of blast furnaces, 65.7 per cent., and that of forges and bloomeries decreased 58.6 per cent.

The average investment in blast furnaces and in steel works and rolling mills per establishment has increased heavily since 1890, as shown by the following tabular statement:

Census.	Blast furnaces.	Steel works and rolling mills.	Forges and bloomeries.
1905	$990,173	$1,499,223	$36,663
1900	580,046	945,224	44,249
1890	374,184	662,638	33,593

In the 15-year period the average amount of capital per establishment for blast furnaces and steel works and rolling mills has more than doubled.

Distribution of Labor.

At the census of 1905 the labor employed by blast furnaces constituted 14.5 per cent. of the total; that employed by steel works and rolling mills, 85.5 per cent., and that employed by forges and bloomeries was, in comparison, a negligible quantity. In 1900 blast furnace establishments employed 17.7 per cent. of all labor; steel

works and rolling mills, 82.2 per cent., and forges and bloomeries, one-tenth of 1 per cent. In 1890 blast furnaces employed 19.5 per cent. of the total; steel works and rolling mills, 80.2 per cent., and forges and bloomeries, three-tenths of 1 per cent. In 1880 blast furnace labor was 29.6 per cent. of the total; that of steel works and rolling mills, 68.3 per cent., and that of forges and bloomeries, 2.1 per cent. It will be seen that the average number of wage earners employed in the steel works and rolling mill branch of the industry has constituted in each successive year a larger proportion of the total, increasing from 68.3 per cent. in 1880 to 85.5 per cent. of all labor in 1905; that the wage earners employed in the blast furnace branch have fluctuated in number, but constitute a smaller portion of the total, decreasing from 29.6 per cent. in 1880 to 14.5 per cent. in 1905, and that the labor employed in forges and bloomeries has rapidly decreased.

The women and children employed as wage earners are practically all in steel works and rolling mills. The women employed are distributed, in the order of numbers, in New Jersey, Pennsylvania, Illinois, Ohio, Massachusetts, New York, Connecticut, Indiana, Maryland, Kentucky and California. The main increase in number, 1900 to 1905, has been in the States of New Jersey, Illinois, Ohio, Connecticut and New York. The total number of children employed remained substantially the same, the decreases in certain States counterbalancing the increase in others. The principal increases in number of children employed, 1900 to 1905, have been: In Alabama, from 24 to 181; in Pennsylvania, from 1082 to 1236; in Maryland, from 23 to 75; in Ohio, from 43 to 72; in Kentucky, from 15 to 35, and in Delaware, from 9 to 27. New Jersey and New York reported 65 and 18, respectively, in 1900, and none employed in 1905. Illinois shows a decrease from 193 to 13; Indiana, from 80 to 3; West Virginia, from 140 to 84, and Missouri, from 15 to 4.

Fuel Consumed in the Industry.

The following table shows the quantity and cost of fuel used in the blast furnaces, steel works and rolling mills and forges and bloomeries in 1900 and 1905 by kinds:

		Blast furnaces.		Steel works and rolling mills.		Forges and bloomeries.	
		Tons.	Cost.	Tons.	Cost.	Tons.	Cost.
Anthracite coal and culm	1905	560,637	$1,812,779	231,125	$792,262	.....	.....
	1900	886,564	2,297,419	944,018	1,220,694	.....	.....
Bituminous coal and slack	1905	801,640	1,340,997	7,054,099	14,365,633	994	$2,301
	1900	832,235	1,101,312	10,944,046	14,679,804	1,553	2,771
Coke	1905	19,739,676	57,127,027	638,747	2,009,295	29	97
	1900	16,461,533	38,976,770	926,516	2,014,390	67	240
		Bushels.		Bushels.		Bushels.	
Charcoal	1905	37,796,739	2,538,452	2,968,784	283,916	164,749	15,222
	1900	31,421,585	1,846,201	2,250,022	170,345	1,538,280	85,241
				Barrels.			
Oil used for fuel	1905	.....	.....	633,813	908,154	.....	.....
	1900	.....	.....	1,302,615	1,158,748	.....	.....
Natural gas	1905	.....	83,087	.....	4,382,667	.....	.....
	1900	.....	.....	.....	3,098,409	.....	.....

In addition to the cost of fuel used in steel works and rolling mills, as shown in the above table, the cost of fuel used for power in 1905 amounted to $12,433,414, but no figures are given for 1900, nor was this class of fuel separately reported for blast furnaces or forges and bloomeries.

Cost of Materials.

The following table shows the quantity and cost of iron ore, mill cinder and fluxing material consumed in the manufacture of iron and steel in the several census years, 1880 to 1905:

	Census.	Totals. Tons.	Totals. Cost.	Blast furnaces. Tons.	Blast furnaces. Cost.	Steel works and rolling mills. Tons.	Steel works and rolling mills. Cost.	Forges and bloomeries. Tons.	Forges and bloomeries. Cost.
Totals	1905	40,784,786	$114,070,455	40,234,791	$111,673,663	549,995	$2,396,792	.....	.....
	1900	34,649,100	76,089,080	34,302,799	74,740,271	340,028	1,326,395	6,282	$22,414
	1890	21,725,699	74,254,942	21,189,708	70,789,216	519,199	3,355,139	16,792	110,587
	1880	10,029,379	39,974,700	9,624,894	36,663,281	333,405	2,779,879	71,080	531,540
Iron ore	1905	30,592,180	103,346,823	30,042,185	100,950,031	549,995	2,396,792	.....	.....
	1900	25,722,090	67,257,063	25,375,780	65,908,254	340,028	1,326,395	6,282	22,414
	1890	15,558,412	66,971,256	15,022,421	63,505,530	519,199	3,355,139	16,792	110,587
	1880	6,883,667	36,516,697	6,479,182	33,205,278	333,405	2,779,879	71,080	531,540
Mill cinder, scrap, &c.	1905	1,865,385	3,830,961	1,865,385	3,830,961	.....	.....	.....	.....
	1900	1,600,313	3,772,385	1,600,313	3,772,385	.....	.....	.....	.....
	1890	1,145,599	3,086,808	1,145,599	3,086,808	.....	.....	.....	.....
	1880	316,114	910,667	316,114	910,667	.....	.....	.....	.....
Fluxing material	1905	8,327,221	6,892,671	8,327,221	6,892,671	.....	.....	.....	.....
	1900	7,326,706	5,059,632	7,326,706	5,059,632	.....	.....	.....	.....
	1890	5,021,688	4,196,878	5,021,688	4,196,878	.....	.....	.....	.....
	1880	2,829,598	2,547,336	2,829,598	2,547,336	.....	.....	.....	.....

The consumption of iron ore increased 18.9 per cent. in 1905 over 1900, as compared with an increase of 65.3 per cent. shown in 1900 and an increase of 126 per cent. in 1890. The relatively small amount used in steel works and rolling mills, it will be observed, showed a large decrease in 1900, largely due to decrease in the number of active puddling furnaces. The decrease in the amount of iron ore consumed by steel works and rolling mills has been more than regained through the general growth of the industry, the amount consumed in 1905 slightly exceeding that used in 1890. No consumption of iron ore is reported by the forges and bloomeries manufacturing blooms and bars for sale. The iron ore consumed shows an average cost of $3.38 per ton in 1905, as compared with $2.61 in 1900, $4.30 in 1890 and $5.30 in 1880.

The mill cinder, scrap, &c., is that which is purchased by the reporting establishments, and does not include such material when made and consumed by the same establishment. The amount shows a steady increase, and an average cost in 1905 of $2.05 per ton, as compared with $2.36 in 1900, $2.69 in 1890 and $2.88 in 1880.

The quantity of fluxing material used shows an increase of 13.7 per cent. from 1900 to 1905, 45.9 per cent. from 1890 to 1900, and 77.5 per cent. from 1880 to 1890. The average cost per ton was 83 cents in 1905, 69 cents in 1900, 84 cents in 1890, and 90 cents in 1880.

A table on the next page shows the quantity of pig iron, scrap iron and steel and all forms of iron and steel purchased and consumed by steel works and rolling mills and forges and bloomeries in 1900 and 1905. The scrap iron and steel embraces only purchased material and does not include scrap produced by iron and steel plants and consumed by the producing establishment.

Every kind of iron and steel material purchased shows an increase for the period 1900 to 1905; pig iron, an increase of 17.1 per cent.; scrap iron and steel, 24.2 per cent.; hammered scrap blooms and imported Swedish billets and bars, 150.5 per cent.; muck or scrap bar, 27.7 per cent.; ingots, blooms, billets, &c., not including Swedish billets, &c., 25.8 per cent.; and wire rods (purchased), 18.4 per cent. Iron and steel material as a whole increased 22.7 per cent. in quantity and 14.1 per cent. in value.

Production by Branches.

The following table shows the total production of all kinds of iron and steel, by branches of the industry, for the census years 1900 and 1905:

	1905.	1900.
Blast furnaces	16,628,294	14,452,234
Steel works and rolling mills	18,211,013	15,040,120
Forges and bloomeries	5,626	15,497
Total	34,844,933	29,507,800

The blast furnace products include spiegeleisen, ferro-

KIND.	1905. Tons.	1905. Cost.	1900. Tons.	1900. Cost.
Total	22,762,901	$366,454,993	18,551,442	$321,146,512
Pig iron, spiegeleisen, ferromanganese, and all other pig iron	12,191,228	172,101,436	10,411,281	151,064,348
Old iron or steel rails, and other scrap iron or steel	5,124,277	67,601,248	4,126,980	66,852,621
Purchased hammered iron ore blooms, pig or scrap blooms, and imported Swedish billets and bars	81,969	1,781,126	32,720	1,150,575
Purchased muck or scrap bar	205,951	5,066,732	161,329	4,535,939
Purchased iron or steel ingots, blooms, billets, tin plate bars, sheet bars, or slabs (except imported Swedish billets and bars)	4,632,257	103,420,970	3,682,407	92,123,412
Purchased wire rods	161,914	4,774,383	136,725	5,419,617
Purchased iron or steel skelp	259,643	7,331,935	[1]	[1]
All other iron or steel	105,662	4,377,163	[1]	[1]

[1] Not reported separately.

manganese, ferrosilicon, and castings made direct from the blast furnace. Likewise, there is included in the products of steel works and rolling mills the quantity of steel ingots produced for sale. It should be remembered that duplications are necessarily involved, inasmuch as the blast furnace products enter as material into the output of the steel works and rolling mills and of the forges and bloomeries, and many steel works and rolling mills produce for sale partially finished products, such as muck and scrap bar, billets, slabs, sheet bars, tin plate bars, &c., which figure as material purchased in the reports of other establishments when they are rolled into finished forms. In many instances there is even a second and a third duplication. However, as similar methods of tabulation were employed in previous censuses, the totals are directly comparable.

Equipment and Capacity of Establishments.

The table given below shows the number of blast furnaces, steel works and rolling mills and forges and bloomeries, both active and idle, in the United States in 1905, as compared with 1900, 1890 and 1880, and the equipment and capacity of the same:

	1905.	1900.	1890.	1880.
Blast furnaces:				
Number of establishments	265	273	377	483
Number of completed furnaces	435	399	559	681
Total daily capacity, tons of pig iron	87,498	58,569	37,889	17,186
Steel works and rolling mills:				
Number of establishments	[1] 518	476	429	391
Total daily capacity, finished rolled and forged products, tons, double turn	[1] 115,210	90,122	41,576	19,730
Bessemer steel establishments, included above	49	42	51	11
Bessemer steel converters, number	103	91	97	24
Total daily capacity, tons of ingots, double turn	45,427	38,420	19,285	3,988
Open-hearth steel establishments, included above	126	96	58	25
Open-hearth furnaces, number	515	331	129	37
Total daily capacity, tons of ingots, double turn	35,457	19,030	3,608	738
Acid furnaces, number	159	152	.....	.....
Total daily capacity, tons of ingots, double turn	7,750	6,419	.....	.....
Basic furnaces, number	356	179	.....	.....
Total daily capacity, tons of ingots, double turn	27,707	12,611	.....	.....
Crucible steel establishments, included above	49	40	47	37
Number of pots which can be used at a heat	2,939	2,619	2,606	2,691
Forges and bloomeries:				
Number of establishments	7	14	32	118
Total daily capacity, tons of blooms, billets, and bars, double turn	92	143	263	464

[1] Includes 31 establishments other than steel works and rolling mills.

A concentration of the pig iron industry has continued, as shown by the decrease in number of establishments for each successive census, but the completed furnaces in 1905 show an increase of 36 in number, though at each prior census there was a marked decrease, due chiefly to the dismantling of stacks which were badly located and not equipped for competition with the large modern furnaces. The daily capacity of the furnaces, however, has rapidly increased, the increase being 49.4 per cent. from 1900 to 1905, as compared with a decade increase of 54.6 per cent. for 1900, and 120.5 per cent. for 1890; and in average capacity per furnace there is shown a steady increase from 25 tons per day in 1880 to 68 tons in 1890, 147 tons in 1900, and 201 tons in 1905. The pig iron product for 1905 was 52.1 per cent. of the yearly capacity (365 days) of all completed furnaces, as compared with 67.6 per cent. in 1900, 64 per cent. in 1890, and 53.8 per cent. in 1880.

The steel works and rolling mills show an increase in number, and in fact the number of plants is in excess of the number of establishments reported; for, as before explained, in some cases the operations of two or more mills, when under one ownership and within the same municipality or district, are covered by one report. The capacity in finished rolled and forged products of all steel works and rolling mills increased 110.7 per cent. for the decade ending 1890, 116.8 per cent. for 1900, and 27.6 per cent for the five year period 1900 to 1905. The average daily capacity per establishment in finished rolled and forged products, double turn, increased from 50 tons in 1880 to 97 tons in 1890, 189 tons in 1900, and 222 tons in 1905.

The tonnage of rolled, forged and other classified products amounted in 1905 to 52.8 per cent. of the yearly capacity of all steel works and rolling mills, computed on the basis of 300 working days, double turn, as compared with 55.6 per cent. in 1900, 59.2 per cent. in 1890 and 51.5 per cent. in 1880.

The output of Bessemer steel, ingots and castings for 1905, in like manner, was 57 per cent. of the capacity of all converters for the year (300 days), double turn, as compared with 65.3 per cent. in 1900, 62.5 per cent. in 1890 and 73.5 per cent. in 1880. And the open hearth steel products, ingots and castings was 54.7 per cent. of the yearly capacity (300 days) of all open hearth steel furnaces, on double turn, as compared with 53.3 per cent. in 1900. The acid open hearth furnace capacity, as compared with 46.2 per cent. in 1900, and the basic open hearth product was 60.9 per cent. of the furnace capacity, against 56.9 per cent. in 1900. The crucible steel establishments show a substantial increase in number and in pot capacity.

Pig Iron Product.

The following table shows the pig iron product by tonnage, value and average value per ton for 1890, 1900 and 1905:

Census.	Number of completed furnaces	Tons.	Value.	Average value per ton.
1905	435	16,628,294	$228,977,535	$13.77
1900	399	14,452,234	206,579,400	14.29
1890	559	8,845,185	145,612,983	16.46
1880	681	3,375,912	88,204,010	26.13

The percentage which each grade of pig iron formed of the total in 1900 and 1905 is shown by the following statement:

Grade.	Per cent. of total pig iron production. 1905.	1900.
Bessemer	53.5 }	58.6
Low-phosphorus	1.2 }	
Malleable Bessemer	1.9	....
Basic	15.4	6.5
Foundry	22.1	24.3
Forge	3.6	7.3
White and mottled, and miscellaneous grades	0.6	1.4
Ferrosilicon	0.3	0.3
Spiegeleisen	1.0	1.1
Ferromanganese	0.3	0.4
Direct castings	0.1	0.1

Bessemer and low phosphorus combined constituted 54.7 per cent. of the total pig iron production of 1905, as compared with 58.6 per cent. of 1900, when low phosphorus was reported under Bessemer. The combined product was 9,087,379 tons, an increase of 611,849 tons over 1900, or 7.2 per cent.

Basic pig iron shows the heavy increase of 172.4 per cent. Its proportion of the total pig iron product increased from 6.5 per cent. in 1900 to 15.4 per cent. in 1905.

Foundry, forge, and the white and mottled and miscellaneous grades form smaller proportions of the total production than in 1900; in quantity, foundry pig iron increased but 164,500 tons, or 4.7 per cent., while the amount of forge pig iron is 455,660 tons less than in 1900, or a decrease of 43.1 per cent., and the white and mottled and miscellaneous grades show a decrease of 109,239 tons, or 52.4 per cent. Ferrosilicon shows an increase of 46.5 per cent.; spiegeleisen, 3.6 per cent.; ferromanganese, 11.8 per cent.; and direct castings, 32.9 per cent.

Iron for steel making—comprising Bessemer, low phosphorus, basic, ferrosilicon, spiegeleisen and ferromanganese—aggregated 11,921,578 tons, an increase of 2,257,149 tons, or 23.4 per cent. over the production of like grades in 1900; while iron for use in puddling furnaces, namely, forge, and white and mottled iron, aggregated 701,040 tons, a decrease of 44.6 per cent. In 1900 pig iron for steel making was a little over seven times that made for use in puddling furnaces, and now it is 17 times in quantity.

Geographical Distribution.

Pennsylvania produced one-half of the Bessemer (50.1 per cent.); nearly three-fourths of the low phosphorus (72.5 per cent.); nearly three-fourths of the basic (71.5 per cent.; over one-fifth of the foundry (21.7 per cent.) more than one-half of the forge (52 per cent.); over three-fifths of the spiegeleisen (62.7 per cent.); all of the ferromanganese; nearly one-third of the direct castings (31.1 per cent.); and relatively small amounts of the remaining grades—namely, malleable Bessemer, 3.9 per cent.; white and mottled, and miscellaneous grades, 12.2 per cent.; and ferrosilicon, 7 per cent.

Ohio, which was second in total products, was second in the production of Bessemer pig iron (23.8 per cent.) and first in malleable Bessemer (40.2 per cent.) and in direct castings (54.2 per cent). In basic pig iron Ohio, keeping pace with the large general growth of this grade, has increased from 93,700 tons in 1900 to 206,458 in 1905, or 120.3 per cent, but is now exceeded in basic iron product by Alabama as well as Pennsylvania, and hence ranks third. In direct castings Ohio ranks first, with 54.2 per cent., and in ferrosilicon second, with 31.4 per cent. More than one-half of the ferrosilicon product is reported from Kentucky. Illinois, as in 1900, is the third in the production of Bessemer pig (16 per cent.) and second in spiegeleisen (26.2 per cent.). Alabama did not produce any Bessemer, but is first in foundry iron (27.9 per cent.) and second in basic (11.8 per cent) and in forge (19.2 per cent.). The increase in basic pig iron in Alabama over its 1900 production, 235.2 per cent., is relatively the largest for any State that produced basic pig iron in 1900. Eleven States produced Bessemer and low phosphorus pig iron in 1905 and 12 in 1900; Kentucky, New Jersey and North Carolina reporting Bessemer pig in 1900 but none in 1905, and Michigan and New York reporting Bessemer in 1905 but not in 1900. Basic pig iron was made in eight States; malleable Bessemer in 9; foundry pig in 16; forge pig in 10; white and mottled and miscellaneous grades in 10; spiegeleisen in 4; ferromanganese and ferrophosphorus each in 1; ferrosilicon in 3, and direct castings were made in seven States.

Products of Steel Works and Rolling Mills.

In the following table will be found a statement of the products of the steel works and rolling mills by kind, quantity and value, for the census years 1890, 1900 and 1905:

Kind.	1905. Tons.	1905. Value.	1900. Tons.	1900. Value.	1890. Tons.	1890. Value.
Totals	.....	$673,965,026	.....	$596,689,284	.....	$331,860,872
Rails:*						
Iron	900	20,700	880	31,180	13,715	622,224
Steel	2,193,705	58,236,050	2,250,457	46,501,979	1,853,862	60,272,575
Bessemer	2,065,024	54,627,488	†	†	1,853,862	60,272,575
Open hearth	128,681	3,608,562	†	†	‡	‡
Splice bars, including all patent splices and rail joints	174,055	5,663,052	†	†	†	†
Iron and steel bars and rods, not including sheet or tin plate bars or wire rods	2,442,810	84,069,122	2,493,159	100,597,221	1,572,347	68,567,415
Iron and steel wire rods	1,792,704	52,995,031	916,587	35,529,529	†	†
Structural shapes:						
Iron	4,475	145,200	27,091	1,051,556	122,792	6,941,474
Bessemer steel	331,671	11,089,170	263,800	8,381,717	85,440	4,529,411
Open hearth steel	618,391	21,496,531	566,092	19,928,249	68,123	3,992,074
Iron and steel hoops, bands and cotton ties	337,223	12,760,010	§1,195,189	§49,159,747	‖546,203	‖23,628,849
Iron and steel skelp	1,557,690	46,780,202	.....	.....	.....	.....
Iron and steel rolled car axles	631	26,138	2,229	88,841	2,232	127,500
Iron and steel hammered car axles	82,954	2,849,691	100,377	4,394,096	52,184	2,935,451
Iron and steel muck and scrap bar produced for sale	150,926	3,940,998	203,681	5,940,587	252,089	7,411,748
Iron and steel boiler and other plates and sheets, except nail and tack plate, black plates or sheets for tinning, and armor plate	1,856,469	77,802,001	1,488,066	68,109,223	652,693	39,359,094
Iron and steel nail plate	67,857	1,826,756	81,101	2,466,340	†	†
Iron and steel tack plate	18,744	635,320	16,563	650,218	†	†
Black plates or sheets for tinning:						
Iron	64,111	2,809,936	‡	‡	†	†
Bessemer steel	353,027	18,271,625	355,077	18,673,312	†	†
Open hearth steel	86,887	4,215,518	38,937	2,294,494	†	†
Iron and steel armor plate and gun forgings	22,839	9,560,816	15,302	7,526,479	†	†
Iron and steel rolled blooms, slabs, billets, tin plate bars, and sheet bars produced for sale	4,823,585	109,611,104	4,172,286	96,321,887	†	†
Steel ingots produced for sale	196,404	3,985,310	103,707	2,781,145	†	†
Direct steel castings	¶287,325	¶20,660,136	177,156	14,609,893	†	†
All other products	.....	124,574,609	.....	111,651,591	.....	113,473,057

* Rails renewed or rerolled included under "all other products."
† Not reported separately.
‡ None reported.
§ Includes skelp.
‖ Hoops and skelp only.
¶ Exclusive of 4184 tons of steel castings, valued at $347,264, made by establishments engaged primarily in the manufacture of other products.

Products of Forges and Bloomeries.

The following table shows the quantity and value of the products of forges and bloomeries in 1900 and 1905:

Kind.	1905. Tons.	1905. Value.	1900. Tons.	1900. Value.
Totals	...	$158,612	....	$522,432
Blooms and bar iron direct from iron ore	...	.....	3,142	114,413
Blooms, billets, &c., from pig iron and scrap iron and steel	5,626	157,505	12,355	403,194
All other products	...	1,107	....	4,825

Localization of Industry.

For the United States as a whole the products of the steel works and rolling mills constitute approximately three-fourths of the total in value, and the blast furnace products one-fourth, and there has been in the main an increase in the proportionate share for steel works and rolling mills with each census. The same may also be said of the Middle and Western States. In the Southern States the blast furnace products form nearly one-half of the total in value and more than two-thirds in tonnage. In 1890, as compared with 1880, there was a very heavy increase in the blast furnace industry in the Southern States, as compared with steel works and rolling mills, since which time the products of the steel works and rolling mills have been gaining on the blast furnaces. In the New England States the blast furnace products form but a small part of the combined total.

New England States.

In the New England States there is shown a substantial increase in capital since 1900, practically all in steel works and rolling mills; likewise large increases for the decades ending in 1900 and 1890.

The products of the steel works and rolling mills have increased with each census, and the proportionate share of the total for the United States has slightly increased in tonnage since 1900, although slightly decreasing in proportionate value.

The pig iron product is all charcoal pig.

The 17 establishments in the New England States in 1905 engaged in the manufacture of steel or of rolled iron or steel products do not include three establishments otherwise classified and whose products were all consumed in construction of machinery, &c. The capital invested in the active establishments includes $325,000 of rented property in 1905 and $115,000 of rented property in 1890.

Since the census of 1900 the New England States have become steel producers. There are nine establishments in Massachusetts, Rhode Island and Connecticut having steel making equipments, including two establishments in Massachusetts otherwise classified, one as "foundry and machine shop products," and one as "electrical machinery," and one in Connecticut classified as "cutlery and edge tools," but not including one governmental establishment. The steel equipment of these establishments includes three converters of a daily capacity of 208 tons, including one Clapp-Griffiths and two Tropenas converters (the Government establishment has one Tropenas converter), and 20 open hearth steel furnaces of 1095 tons daily capacity, of which 10, of 365 tons daily capacity, are acid and 10, of 730 tons daily capacity, are basic. Of the open hearth furnaces, three acid furnaces of 45 tons daily capacity are in the "otherwise classified" industries. The tabulated steel output of the New England States in 1905 was 300 tons of Bessemer steel ingots, 168,928 tons of open hearth steel ingots, of which 33,774 tons were acid and 135,154 tons were basic, 2446 tons of open hearth steel castings and 4778 tons of crucible steel. The total product was 176,452 tons of steel of a value of $3,963,006.

Middle States.

The Middle States show a decrease of 46 in the number of establishments, with an increase of $234,842,289, or 65.3 per cent. in capital since 1900, the largest in amount and per cent. of any of the divisions for this period. The increase is relatively a little the larger in steel works and rolling mills.

The total number of active blast furnace establishments in the Middle States in 1905 was 79, compared with 95 in 1900, 140 in 1890, and 179 in 1880. The capital invested includes rented property valued at $2,116,480 in 1905, $3,165,181 in 1900, and $2,210,000 in 1890. The reduction in number of wage earners employed in the blast furnace industry is due to improvements in equipment, chiefly in the use of pig casting machines and in improved charging and ore handling devices. Of the pig product, 32,704 tons were charcoal pig iron, and 8,568,470 mineral fuel pig.

In addition to the 227 establishments in the Middle States that produced steel ingots or castings or rolled iron and steel in 1905, there were 10 establishments otherwise classified. The distribution and equipment of the latter are shown in Table 13. The capital invested in active establishments includes $7,741,886 of rented property in 1905, $10,564,736 in 1900, and $978,000 in 1890.

Southern States.

The Southern States show a decrease of 11 blast furnace establishments and an increase of 10 steel works and rolling mills, making a net decrease of one. The increase in the number of wage earners is relatively small, owing to the fact that in the Southern States the blast furnace branch forms a relatively larger part of the iron and steel industry than in the other divisions, and the improvements in blast furnace equipment have materially reduced the number of wage earners required.

The capital reported for the furnace establishments in the Southern States includes rented property of the value of $51,500 in 1905, $460,500 in 1900 and $783,000 in 1890.

The steel works and rolling mills in the Southern States do not include one establishment classified as "shipbuilding, iron and steel," and having a Tropenas converter, the steel product being used in their works. There is included in invested capital for steel works and rolling mills the value of rented property as follows: $714,000 in 1905; $957,313 in 1900, and $500,000 in 1890.

The steel production of the Southern States in 1905 amounted to 841,671 tons, of a value of $15,302,150. This comprised 607,343 tons of Bessemer steel (606,166 tons of ingots and 1177 castings), 233,152 tons of basic open hearth steel ingots, 570 tons of basic open hearth steel castings, 6 tons of crucible steel ingots, and 600 tons of crucible steel castings. The 10 establishments in the Southern States which are equipped for steel making have 10 Bessemer converters of a daily capacity of 4460 tons, and 21 open hearth furnaces; 20 are basic and 1 acid. The figures do not include the equipment of one establishment otherwise classified, nor one 2 gross ton Tropenas steel converter at the Naval Gun Factory, Washington, D. C.

Western States.

The value of the rented property included in the amount of capital reported for the Western States was $957,753 in 1905, $1,821,091 in 1900 and $3,687,058 in 1890. The value of the rented property was distributed as follows: In blast furnace, $790,303 in 1905, $1,271,200 in 1900 and $2,068,058 in 1890; and in steel works and rolling mills, $167,450 in 1905, $549,891 in 1900 and $1,619,000 in 1890.

There were also 17 establishments otherwise classified in the Western States in 1905, which were provided with equipments for the making of steel or rolled iron and steel products for their own use. Four of these establishments reported the manufacture of 3608 tons of steel as partial products. W. L. C.

Alcohol fuel has certain advantages over gasoline in the matter of storage. If a can of gasoline be left open near a flame, it is likely to explode by the ignition of its vapor. This could never occur with alcohol. Then again, water is useless to quench burning gasoline, serving only to spread the fire by floating the burning liquid. Alcohol can never present this danger, for it mixes with water in all proportions, and in so doing becomes noninflammable. The use of the fuel in submarine boats, or other hazardous places, the superior safety of alcohol must lead to its ultimate adoption.

The Monterey, Mexico, Steel Plant.

MONTEREY, MEXICO, June 17, 1907.—A new era in the architecture and construction of buildings has dawned in Mexico. The first steel frame building in this country was erected in the city of Mexico only a few years ago. It proved such an improvement over the old time business buildings that the Federal Government adopted the new idea in the erection of the great post office building in the capital city, which was recently completed, and in the new National Theatre, which is now in course of construction there. Other large buildings in which steel will be the chief material used are planned for the city of Mexico and other cities of this country.

Large Ore and Coal Properties.

The establishment of the great iron and steel plant in Monterey by the Compania Fundidora de Fierro y Acero, at a cost of more than $10,000,000, is largely responsible for the transformation that is being wrought in the character of buildings of the country. United States steel makers compete with the Monterey company to some extent in structural steel, but the Federal Government has shown a disposition to encourage the new industry and to make it possible for the great iron ore and coal deposits of Mexico to be thus utilized. In the matter of ore holdings, this company owns two groups of iron mines. One is situated in the mountain chain of the Carrizal, State of Nuevo Leon, and is known as the Golondrinas group, and the other is in the Cerro de Mercado. State of Coahuila, and is known as the Monclova group. It is stated that in the Golondrinas mines 10,039,760 metric tons of iron ore are blocked out. There re four more iron ore deposits, each equally as large, which are owned by the concern. It is estimated that it has enough iron ore in sight to run it for 50 years.

The coal fields, which are owned and operated in connection with the Monterey steel plant, are situated in the neighborhood of Barroteran, State of Coahuila. The immensity of these deposits may be realized to some extent when it is known that the company has in sight more than 500,000,000 metric tons of coal. This coal is of good coking quality, and at the properties there are in operation 120 coke ovens. The development of the coal fields is only well started. This abundance of cheap fuel, within easy transportation distance of Monterey, means much for the industrial welfare of the city. To afford a means for opening up these iron and coal mines, the owners of the steel plant have already built and have in operation about 40 miles of railroad. Additional lines will be built as conditions demand.

The officers of the Compania Fundidora de Fierro y Acero are naturally reticent as to the details of its affairs. Notwithstanding the large business which it is doing in the way of manufacturing structural steel and pig iron, it has had many serious difficulties to encounter in order to place it upon a sound business footing. There are problems which will require several more years to solve before the practical success of the new industry has reached the point that is being so earnestly sought.

Not Now Making Steel Rails.

It has been demonstrated by experience that the plant cannot manufacture and sell steel rails at a profit, and this branch of the industry has been temporarily suspended. The competition in steel rails comes mainly from Belgian manufacturers. It is stated that three years ago, shortly after the Monterey plant began to manufacture steel rails, the Belgian product was laid down at the port of Tampico at the exceedingly low price of $21.75 per ton. Later, the Belgian rails were sold in Mexico as low as $24 per ton. The Monterey plant could not meet such prices as these. The steel rail manufacturers of Bilbao, Spain, were also strong competitors for Mexican business. The steel rails for the new railroad which E. H. Harriman and associates are building down the West coast of Mexico come from Bilbao. It is stated that they cost $25 laid down in Galveston, from which point they were shipped in bond to Mexico. It is the opinion in business circles of Mexico that the Mexican Government will come to the relief of the Monterey company by raising the duty on steel rails. This was done in the matter of structural steel products when the plant was ready for supplying the markets of this country. The duty was not raised to a prohibitive figure, but to a point that made it possible for the new industry to meet legitimate and healthy competition from foreign sources. There is a vast amount of railroad building now in progress and in prospect in Mexico, and the demand for steel rails will continue active for many years. In view of this fact, and those above given, it is thought that the present shutdown of the steel rail department of the Compania Fundidora de Fierro y Acero does not mean that that feature of the industry is to be permanently abandoned.

The Monterey Company has spared no expense in equipping its mines with modern machinery and facilities for getting out and handling the ores. Of the iron deposits that exist in the Golindrinas District, the ones being exploited at present are El Cinco de Mayo, Anillo de Hierro, La Cueva, La Piedra Iman and Los Dos Hermanos. The mineral extracted from Cinco de Mayo is first stored in an ore bin at the foot of the outcrop. From there it is loaded on 3-ton, wooden dump cars that run on a narrow gauge railroad nearly ½ mile long, connecting the deposit with the top of an inclined cable runway. From there, through a chute, the ore is loaded on the cars running on the incline. The top of the incline is about 3100 ft and the foot of the incline about 2600 ft. above the sea level. At the foot of the incline the ore is dumped in another chute. A narrow gauge railroad conveys the ore a distance of 2 miles to another chute. Lines of railroad leading to the other mines converge at this point, and the deposit of each mine is kept separate, as they differ slightly in their chemical composition. The ore of the Piedra Iman is handled by means of an aerial cableway about 6300 ft. long, and an inclined railroad.

Kindred Industries Being Developed.

Not only are the vast iron and coal deposits of Northern Mexico of the greatest importance to the steel plant directly concerned, but there are many kindred industries which are already profiting and will profit to a still greater degree in the future from the development work of these native resources that is now being carried on. It is interesting to note that American capital and enterprise are quick to see these advantages, and that they are grasped as potential factors in the great American industrial conquest that is now being waged in this country.

No estimate of the value of the coal fields of Northern Mexico has been made. The fact that the Compania Fundidora de Fierro y Acero of Monterey recently transferred its coal mines and undeveloped coal field holdings to a subsidiary company for a consideration of $10,000,000 would indicate that the value of its properties is much greater than was generally supposed.

Steam Turbine Friction.—The ease with which the rotating member of a steam turbine revolves in its bearings, and the length of time it will continue to run after steam has been shut off, indicate that the frictional work of this form of engine is very small. While the friction per revolution in a turbine is much less than in a reciprocating engine of equal power, the number of revolutions in a given time is much higher, and the friction of the two can be directly compared only from the following standpoint: Is the work expended per minute in overcoming friction less with a steam turbine than with a piston engine of the same power? Experiment has as yet thrown very little light on this subject. The difference between the measurable indicated horsepower and shaft horsepower of a piston engine gives the engine friction. Unfortunately, while the shaft horsepower of a turbine may be obtained by a dynamometer, no one has yet discovered a method by which the gross power may be measured. It is interesting to note that Dr. Riedler, eminent for his improvements to reciprocating machinery, says that the turbine is no longer the motor of the future; it is the steam engine of the present.

Mexican Railroad and Industrial Notes.

DURANGO, June 27, 1907.—Construction work on railroad extensions continues active, but this movement will probably be checked in some districts with the advent of the rainy season. To the great relief of rancheros and city residents alike this season has set in and the long drought has been broken. Recent activities in the railroad world are recorded in the following notes:

A new line is projected in the State of Zacatecas, application having been made to the Government by John Cooper and an associate, who purpose constructing a railroad to connect with the Mexican Central at the station of Camacho, and to run to Tecolote, Cedros and Bonanza. A branch is also projected between Cedros and Salaverna. The road will be a mining transportation proposition and its length about 140 km.

It is said that the International Land & Mining Company intends to construct a railroad, 90 miles in length, from a point on the National to certain coal lands near the Texas border, which the former has recently purchased from General Naranjo of Monterey.

The Southern Pacific Railway Company has let a contract for the construction of a portion of its line in the State of Jalisco to the Mexican Construction & Engineering Company of the capital. Work will be commenced at Orendain, 25 miles west of the city of Guadalajara. Rapid progress is being made on the company's extension in Sonora. The location of the Guaymas-Guadalajara line as definitely decided upon, is by way of Orendain, Tequila and Tequesquite.

A short branch of the Tehuantepec National, between Chinameca and Minatitlan, was opened for traffic in May. The main line has been keep busy since the first of the year transporting the cargoes of American-Hawaiian steamers between the terminals.

The track of the Pan-American Railway is now complete to the station of Huixtla, 75 km. from the border of Guatemala.

The Atotonilco branch of the Mexican Central, which runs from the town of Ocotlan, on the Guadalajara division, to Atotonilco, and is 35 km. in length, has been completed and will shortly be opened for traffic.

The coal road of the National lines, known as the Jarita-Colombia line, running from Jarita, Nuevo Leon, to Colombia, is about completed, and will, it is expected, be ready for operation by July 1.

A line is projected by the Mexican National Railway Company from a point upon the Matamoros branch to Nuevo Laredo.

The preliminary surveys are being made for the line of railroad between Salvatierra, in Guanajuato, and Puruándiro, in the State of Michoacan, 86 km., for which a concession was granted some time ago to Andres Bermejillo of the City of Mexico.

A concession has been obtained by Rudolfo Valles of Parral for a line from Morita, on the Jimenez-Parral branch of the Central, to the town of Allende.

The concession granted in 1902 to G. Freeman for a line of railroad between Alamos and Ybaros has been annulled and the deposit of $13,200 forfeited, the concessionaire having failed to fulfill his contract.

Industrial Notes.

A concern capitalized at $50,000, and called the Compañia Constructora de Calderos, S. A., has been organized in the city of Guadalajara, whose object is to manufacture boilers under a patent held by William Farrell. The officers of the company are as follows: José Maria Corvera, president; Enrique Alvarez del Castillo, vice-president; Alfred Morfin Silva, secretary; Basave & Co., treasurers. Mr. Farrell will be superintendent and Rafael de la Mora the general representative of the company in Mexico.

Fogarty & Dickinson, machinery and agricultural implement dealers, San Luis Potosi, suffered an estimated loss of $250,000 by fire, May 24. Their warehouse was entirely destroyed. The loss is partially covered by insurance.

Early last month the Industrial Engineering & Supply Company was formed in the city of Mexico, to engage in the general machinery and supply business. The company has rented a four-story building, Calle de Alcaceria, No. 27, and intends to carry a large stock of American manufactured tools and appliances. The president of the company is W. W. Wheatly; general manager, James A. Peirce; general sales agent, W. C. Benbow.

The branch office of the Wellman-Seaver-Morgan Company, has been moved to Alcaicera 27, and W. C. Benbow will hereafter act as sales manager for both that company and the Industrial Engineering & Supply Company.

The railroad companies report the movement of much freight, including more than usually large shipments of mining machinery to the northern mining districts.

A new coal company with $1,000,000 capital stock has been organized in the capital with the object of exploiting coal lands in the State of Coahuila. The concern is named Compañia Nacional Explotadora de Carbon y Coke. Francisco Madero is president; Antonio Hernandez, M. Arraoz, H. Scherer, Jr., Ernest Schroder and Enrique Renner and Antonio Hernandez, secretary.

The Mexican *Herald* of June 5 states that at a meeting of the shareholders of the Monterey Iron & Steel Company held on May 30, it was agreed to cede the coal properties of the company to the Compañia Carbonifera del Norte with a capital of $11,000,000, of which $10,000,000 will be applied to the acquisition of the coal properties, and $1,000,000 will be held for working capital.

Concessions covering water rights have been granted as follows: To Marcelino Valentin to use for irrigation the waters of the River Tuxpan, State of Colima, to the extent of 10,000 liters per second, and to the Sabinas Coal Company, in Coahuila, for coal washing, the right to use the waters of the River Alamos, and to establish the necessary plant for the purpose. J. J. D.

The new North German Lloyd steamship Kronprinzessin Cecilie is a sister ship of the Kaiser Wilhelm der Zweite, which holds the record for the highest sustained speed across the Atlantic, 23.61 knots. The new ship, which will shortly be in service, has a total length of 706½ ft., a breadth of 72 ft. and a depth from upper edge of keel to promenade deck at the side of 52½ ft. The displacement is 27,000 tons, and the gross tonnage about 19,500. Propulsion is by twin screws actuated by four quadruple expansion engines, two on each shaft. The cylinder diameters are respectively, 37½, 49, 75 and 112 in., with a common stroke of 71 in. The total horsepower to be developed is about 45,000, which it is expected will give the ship a sustained sea speed of 23½ knots. There are 19 cylindrical boilers, with an aggregate of 107,643 sq. ft. of heating surface. The coal consumption will amount to about 700 tons per day (about 1½ lb. of coal per horsepower hour), requiring the services of 291 men in the boiler rooms. The bunker capacity of 5600 tons will suffice for eight days' steaming at full speed.

The Engineers' Society of Milwaukee held its annual meeting on the evening of June 26, and elected the following officers for the ensuing year: President, S. L. G. Knox, general manager of the Bucyrus Shovel Company; vice-president, C. W. Burkett, chief engineer of the Wisconsin Telephone Company; treasurer, E. P. Worden of the Worden-Allen Bridge & Iron Company; secretary, W. F. Martin; directors, W. G. Starkweather, F. W. Eells, A. E. Manchester, C. A. Cahill. The regular meetings of the society will be resumed in September.

The engineers composing the organization of Dodge & Day, Philadelphia, have organized the Engineers' and Constructors' Club, to discuss subjects relating to engineering and construction and to give all members the benefit of the experience gained by each in his particular line of work. Membership is confined to those connected with the firm. Harold T. Moore is president, George Walters secretary and F. C. Andrews, H. F. Sanville, John E. Zimmermann, and C. N. Lauer are managers.

The Heat Treatment of Wire.

J. Dixon Brunton, one of the Carnegie scholars of the Iron and Steel Institute, chose the above subject for his research work, studying particularly wire for ropes.* With a view to making the results directly applicable to every day practice, the author experimented with commercial steels, one of them being of Swedish acid open hearth and the other of English acid open hearth manufacture. The analyses were as follows:

	Carbon.	Graphite.	Silicon.	Manganese.	Sulphur.	Phosphorus.
Swedish....	0.75	0.00	0.100	0.640	0.025	0.031
English....	0.83	0.00	0.084	0.710	0.025	0.042

The tests made use of were the ultimate stress, elongation per cent. in 8 in., the torsion in 100 diameters and the specific gravity. To enable the torsions on the various sizes of wire to be compared with each other, they were all made in 100 diameters of the test piece and an average struck from a number of tests.

Tests with the Swedish Steel.

The rod, which was No. 5 wire gauge, was divided into two pieces, and one piece was annealed before any cold work was done. This was to ascertain the effect of a previous annealing, for it has been thought by some that annealing the rod imparted a tougher nature to the finished wire. The rolled and annealed samples will be referred to as Sw. R and Sw. A, respectively. The annealing was carried out in closed oven, without the flame touching the material, at a final temperature of 765 degrees C. (1410 degrees F.). The rod was then allowed to cool slowly. Tests of the rolled and annealed rod gave:

	Torsions.	Ultimate stress. Pounds.	Elongation. Per cent.	Specific gravity.
Sw. R.....	20	117,600	15.3	7.753
Sw. A.....	23	105,952	22.2	7.748

As was to be expected, annealing increased the torsions and elongation and lowered the ultimate stress and specific gravity. The two samples were then treated side by side during the remainder of the research. To enable them to be drawn cold they were first subjected to the following process: They were immersed in hydrochloric acid, specific gravity 1.08 at the atmospheric termperature for 75 min., taken out, thoroughly washed and agitated to rid them of any particles of adhering scale, dipped into boiling milk of lime to neutralize any acid and to form a coating to protect them from rusting. They were then put in a stove at 212 degrees F. for 15 hr. to dry them, and expel any traces of acid.

After this treatment the steels were again tested and gave the following results:

	Torsions.	Ultimate stress. Pounds.	Elongation. Per cent.	Specific gravity.
Sw. R.....	15	107,744	14	7.754
Sw. A.....	34	106,176	24	7.748

The rods were then taken to the drawing mill and passed through the dies at a speed of 142 ft. per minute, with a reduction equal to 7 per cent. The results of the tests after this operation are given hereunder:

	Torsions.	Ultimate stress. Pounds.	Elongation. Per cent.	Specific gravity.
Sw. R.....	13	140,224	7	7.770
Sw. A.....	20	127,456	6	7.760

The samples were then annealed by being passed through a long furnace, a single wire at a time, and not in a bundle as in the first annealing. This was to insure the thorough soaking and annealing of each piece of the sample, for it has been found that on annealing in a bundle the inside laps of the coil of wire cool more slowly, owing to the outer laps retaining some heat. This naturally gives a different molecular structure to the inside laps. They were pulled through at the rate of 32 in. per minute, the temperature of the wire, when coming out, being 890 degrees C. (1634 degrees F.), so that it was well above the recalescence. The wire threw off a thick scale of magnetic oxide, the loss in weight amounting to nearly 6 per cent. On analysis of the wire the carbon and prosphorus were found to have been lowered a few hundredths, the rest of the elements remained practically the same.

* This report appears in full in the *Journal* of the Institute, No. 2, 1906.

After this treatment the wires were again tested, giving the following results:

	Torsions.	Ultimate stress. Pounds.	Elongation. Per cent.	Specific gravity.
Sw. R.....	42	139,104	15	7.750
Sw. A.....	42	137,536	17	7.749

It will be seen that the annealed and unannealed rod had then been brought to practically the same state so far as mechanical tests are concerned. The samples were again cleaned, tested, and were ready for the reducing process. They were reduced cold by means of tapered dies through 17 different passes, and at different rates of speed. The tests, after passing through each side, are given in Tables A and B:

Table A.—Swedish Rolled.

Number of pass.	Reduction. Per cent.	Torsions.	Ultimate stress. Pounds.	Elongation. Per cent.	Specific gravity.
1	5.5	53	153,216	7.0	7.768
2	4.7	38	161,504	6.2	7.779
3	5.5	23	168,000	4.5	7.795
4	5.3	28	173,600	4.5	7.812
5	6.2	41	179,200	6.2	7.819
6	7.2	37	185,920	5.0	7.841
7	7.1	44	191,520	4.0	7.853
8	7.7	40.5	200,480	4.5	7.872
9	7.5	44.5	202,720	4.0	7.888
10	10.0	40	215,040	3.5	7.893
11	10.0	42.5	221,760	6.5	7.916
12	10.0	42.5	232,960	6.0	7.933
13	12.0	41.0	257,600	3.0	7.950
14	13.9	32.0	271,040	3.0	7.972
15	16.0	37.5	314,640	2.5	7.991
16	20.0	21.0	369,600	2.8	7.998
17	10.0	14.0	340,480	3.1	7.997

Table B.—Swedish Annealed.

1	6.4	33	152,992	9.0	7.766
2	5.2	40	163,520	6.2	7.775
3	5.5	38	169,344	5.7	7.796
4	5.3	22	170,912	4.5	7.813
5	6.2	49	179,200	4.5	7.816
6	7.1	38.5	185,920	5.0	7.838
7	7.1	41	192,640	4.5	7.850
8	7.7	39	201,600	3.5	7.867
9	7.5	43	201,600	4.0	7.880
10	9.9	41	202,800	3.7	7.889
11	10.1	42	219,520	4.5	7.911
12	10.0	43	232,960	6.2	7.928
13	12.0	39	255,360	6.5	7.940
14	13.9	36	271,040	5.5	7.962
15	16.0	41	304,640	3.5	7.985
16	20.0	8	351,680	2.5	7.994
17	10.0	29	369,600	3.0	7.996

It will be noticed that the ultimate stress steadily increases with each pass, while the elongation drops to a certain point, jumps up about 3 per cent., then gradually drops again. The torsion advances up to a certain point, then seems to remain steady for one or two passes and then drops. The specific gravity of the material increases steadily the whole time.

Tests with English Steel.

The second series of tests was made in exactly the same way. The samples will be called Eng. R and Eng. A. The rod before drawing gave the following tests:

	Torsions.	Ultimate stress. Pounds.	Elongation. Per cent.	Specific gravity.
Eng. R.....	21	150,304	19	7.761
Eng. A.....	24	129,920	18	7.755

Here again it will be noticed that annealing lowered the ultimate stress and specific gravity and increased the elongation and torsional strength. After cleaning the tests were:

	Torsions.	Ultimate stress. Pounds.	Elongation. Per cent.	Specific gravity.
Eng. R.....	16	136,640	12.0	7.761
Eng. A.....	33	125,440	15.5	7.755

After passing through the dies and being reduced 5 per cent. at 142 ft. per minute the wire gave the following results:

	Torsions.	Ultimate stress. Pounds.	Elongation. Per cent.	Specific gravity.
Eng. R.....	18	163,520	7.5	7.776
Eng. A.....	30	143,360	5.5	7.768

After annealing as before, one wire at a time, the following results were obtained:

	Torsions.	Ultimate stress. Pounds.	Elongation. Per cent.	Specific gravity.
Eng. R.....	24	162,400	11.5	7.756
Eng. A.....	32	162,400	13.0	7.755

The carbon and phosphorus were again found to have been slightly lowered. The samples were then passed through 17 dies, as in the other case, and tables C and D give details of the results obtained, after each successive pass.

Table C.—English Rolled.

Number of pass.	Reduction. Per cent.	Torsions.	Ultimate stress. Pounds.	Elongation. Per cent.	Specific gravity.
1	5.5	16.5	181,440	7.0	7.771
2	4.7	11	185,920	5.5	7.784
3	5.5	15	185,920	6.0	7.792
4	5.3	14	203,840	6.5	7.807
5	6.2	45	207,200	4.5	7.822
6	7.2	23	208,320	4.5	7.845
7	7.1	34	219,520	4.5	7.859
8	7.7	37	221,760	4.0	7.871
9	7.5	37	226,240	4.5	7.891
10	10.0	37.5	244,160	3.7	7.907
11	10.0	37	246,400	3.7	7.919
12	10.0	36	262,080	3.5	7.938
13	12.0	35.5	282,240	3.0	7.957
14	13.9	17	313,600	3.0	7.975
15	16.0	24	371,840	2.5	7.994
16	20.0	9	378,560	3.0	7.988
17	10.0	None.	351,680	1.7	7.971

Table D.—English Annealed.

1	6.4	16.5	179,200	6.5	7.770
2	5.2	13.5	185,920	6.5	7.780
3	5.5	13	190,400	7.5	7.795
4	5.3	10	200,480	5.5	7.810
5	6.2	47	198,240	5.5	7.825
6	7.1	42	204,960	6.0	7.841
7	7.1	36	217,280	4.5	7.856
8	7.7	35	224,000	4.5	7.869
9	7.5	37	228,480	5.5	7.885
10	9.9	36	239,680	4.5	7.898
11	10.1	39	246,400	5.0	7.913
12	10.0	37	266,560	5.0	7.934
13	12.0	38	282,240	5.0	7.955
14	13.9	30	313,600	4.0	7.970
15	16.0	21	365,120	3.0	7.992
16	20.0	11	376,320	2.7	7.987
17	10.0	None.	369,600	3.0	7.973

The results are shown graphically in the author's paper by numerous curves.

Special Tests.

From the sixth reduction onward the samples, after each pass, were tested in a specially constructed machine, composed of two pulleys with a groove cut in them, the bottom of the groove equaling exactly 100 diameters of the sample that was being tested. A pair of pulleys was therefore necessary for each sample. One pulley was keyed to a shaft, running in bearings, supported by two pillars. The other pulley ran loose on a shaft which could move vertically up and down the pillars, and was extended so that variable weights could be hung to it. The sample under test was bent around the pulleys and joined about the center, between the pulleys, by means of a clamp. The top shaft was then made to oscilate, and on the bottom shaft was hung a weight equal to half the ultimate stress of the wire. A counting machine was attached to one of the pillars and an attachment was put on the wire, so that every turn registered itself. As soon as the wire broke the load fell to the bottom of the vertical slot, the sample fell off the machine and the counter stopped. Table E gives the results of these experiments, which are comparative, and represent an action on the wire similar to what happens when the wire rope is actually working in practice:

Table E.—Results of Breaking Tests.

Size of sample Inches.	Number of passes by sample.	Feet traveled by sample. Sw. R.	Sw. A.	Eng. R.	Eng. A.	Rate per minute. Feet.
0.140	6	4,490	8,460	8,861	8,514	168
0.130	7	8,560	7,527	8,140	8,290	157
0.121	8	3,937	6,783	7,088	5,801	147
0.111	9	8,000	7,933	8,521	7,879	131
0.101	10	6,096	8,623	8,025	7,702	115
0.090	11	8,184	8,230	6,239	7,726	105
0.081	12	3,337	3,116	2,465	3,024	84
0.070	13	5,854	4,630	5,229	4,666	73
0.061	14	2,237	4,247	2,229	2,249	63
0.050	15	2,096	2,111	1,602	1,607	52
0.040	16	2,000	2,100	1,563	1,560	40
0.036	17	1,897	1,900	1,420	1,460	36

Comparison of Results.

From a study of the results, especially when plotted graphically, the author finds that the most useful work which a wire does is between 7.885 and 7.910 specific gravity; that is, it does not crystallize so quickly between these points as it does at others. Referring to the tables of the tests, it will be seen that the ultimate stress at these points varies between 201,600 and 221,760 lb. per square inch in the samples from the Swedish steel and between 226,240 and 246,400 lb. per square inch in the samples from the English steel.

The deduction to be drawn is that a steel having, say, 0.75 per cent. carbon, is best drawn to stand 210,000 lb. per square inch, and a steel containing, say, 0.83 per cent. carbon, to stand 234,000 lb. per square inch, and at these points the most useful amount of work can be got out of it before it breaks up. It will also be seen that at this point, as shown by the torsional tests, it is very homogeneous. It might be stated here that the torsion on wire only indicates that the wire is of a homogeneous toughness, as wire ropes are never subjected to this kind of stress.

Photomicrographs were taken of the sample after each treatment, and are given in the author's paper. The rod showed an unequal composition. The long annealing shows the crystals were evenly arranged and the whole steel of a more uniform nature. After the fifth pass the crystals begin to assume a longitudinal direction. At the tenth pass this is very marked, and at this pass the steel is at its best and performs the most useful work. After the fifteenth pass, where the steel is beginning to get brittle—namely, overdrawn—it was found that the fibre of the steel was very much elongated, and at this point there must be a very great strain internally; so much so, that it does not take much to make it show indications of fracture.

The results show that it is possible to increase the specific gravity of steel to 7.998 from 7.768 by cold work, and when it reaches this point and is again subjected to a crushing action by pulling through a die, as in wire drawing, it actually gets lighter, showing that it is impossible by this means to make it more dense. They also show that annealing the rod before the final annealing does not in any way produce better material, as it has been thought to do, and is therefore not necessary.

G. B. W.

Specifications for Cast Iron Pipe.

The question of cast iron pipe specifications came up again at the twenty-seventh annual convention of the American Water Works Association, held at Toronto, Ont., June 18-22. The Committee on Water Works Standards presented a set of specifications for cast iron pipe. It was stated that three specifications are already in the field, those of the New England Water Works Association, the American Society for Testing Materials and the United States Cast Iron Pipe & Foundry Company. The differences between the four above mentioned specifications are said not to be material. It was argued that one specification is wanted rather than four, and it was believed the differences are capable of adjustment. A representative of the United States Cast Iron Pipe & Foundry Company stated that the failure to agree with the New England Water Works Association Committee was due to the fact that some time previous the company had standardized its 14 foundries and did not wish to make further changes of patterns. He expressed the opinion that after another year all could doubtless come together. The association approved the specifications of its committee and requested the committee to confer with those responsible for the other three specifications, with a view to coming together on a single standard.

The McConnell Engineering & Machinery Company, Tacoma, Wash., with a capital of $100,000, has taken over the old plant of the Puget Sound Dry Dock & Machine Company. It is the purpose of the company to enlarge and improve the plant, to which other departments will be added as required. The president of the company, Niven McConnell, was formerly president of the Passaic Steel Company, Paterson, N. J. The secretary is Charles A. Foster.

The Trust Movement in British Industry.*

Lines of Development—Reason Why Trusts Are Formed—Measuring the Value of a Firm—Reducing the Burden of Over-Capitalization—Brains Needed to Run a Trust—Perils of a Fixed Price—Protected Prices in the Retail Trade—Crude Methods of Trust Suppression Are Wrong.

While the term "trust" has been expanded in popular usage to include practically every industrial combination, whatever its type, it is disappointing to find that as serious and painstaking a student of economics as Professor Macrosty accepts it for his title. In this country every penny-a-liner barks the term at every association of manufacturers and merchants, knowing that the yellow journal he serves is seeking to cast odium on successful men to capture the sympathy and influence the minds of the mob. It is all the more unfortunate because Professor Macrosty does not in his book display the slightest touch of such a taint in his dispassionate treatment of the subject.

Every student of economics and every journalist knows how exceedingly difficult it is to secure accurate and complete data concerning combinations in trade, be they simple "gentlemen's agreements" or be they "trusts" in the narrowest and truest sense. Sometimes, though not often, full records are available, after a combination has dissolved, and occasionally court proceedings reveal the aims, the methods and the results. It is therefore usually only very scant material, comparatively speaking, which an investigation can deal with. Professor Macrosty has been very industrious in hunting up such facts as are available to him in the financial and trade press, and he has a really surprising array of data on the organization and the history of English consolidations, syndicates and associations in all branches of trade, covering as he does the whole range. Two of his chapters are devoted to the iron and steel industries, one to the coal and oil trades, the textile, the chemical and grain milling trades, and one to the tobacco and liquor trades. His review of combination movements in the retail trades is highly interesting, and touches also the question much discussed now in this country of protected prices. A chapter entitled "Survey and Conclusions" closes the volume. We quote from it the most significant and striking passages, since they embody the teachings of experience with the combination movement in the industrial world in Great Britain, which, in a modified form, apply to all countries, including our own. It is true, however, that in some respects we have gone considerably farther, and perhaps somewhat more recklessly.

The Lines of Development.

"The preceding chapters have disclosed three main lines of development within the combination movement—integration or vertical combination, as in the iron and steel industry; amalgamation or horizontal combination, as in the textile industries, and terminable associations, as in the retail trades. These lines are not to be regarded as independent, but as closely interwoven. The predominance of integration in the iron and steel trades is due to special features of the industry not elsewhere repeated. The costs of production of each higher stage are reduced by the utilization of some energy which otherwise runs to waste in the lower stage, such as the use of molten iron in steel making and the rolling of the hot ingot in the mills; in both cases there is loss if cold pig iron has to be melted for steel and cold ingots have to be reheated for rolling. . . .

"Over the great bulk of our industries horizontal amalgamation is the representative form of permanent combination, and our survey has shown that there is hardly any description of trade to which it is unsuited. It is equally easy to exaggerate and to undervalue the magnitude of this development. Great as is the extent to which industry has passed into the hands of large combinations, greater still is the domain still subject to the individual trader. But the encroachment on the realm of free competition speedily progresses, though not at the feverish speed of six or seven years ago. We have to reckon with the probability, to use no stronger term, though one might without exaggeration say that certainty, that we are in the early stages of the evolution of the form which industry will take in the future. Whether that be so or not, there are certain features of the movement to which some special attention must be directed.

The Reason Why Trusts Are Formed.

"The special reason for the formation of an amalgamation is always the existence of destructive competition, the result of a surplus of productive capacity. The industry as a whole is overcapitalized, and in the rush to secure enough trade to provide a dividend on each lump of capital prices go tumbling. One way out of such a state of things is to combine only the strong competitors, and trust to their superior efficiency and to the economies of concentrated manufacture to reduce the competition of outsiders to a negligible quantity. . . . Yet the competition even of a decaying firm is not easy to crush out. It may be that the outside business is old-established, and that the value of the plant and buildings has already been written off, thus reducing the standing charges. Or regard may be had only to the income remaining over cost, no interest being charged against capital. . . . Again we have seen that in the iron industry when a firm is driven into insolvency the receiver competes for business at any rate to attract trade and so make a better appearance when he comes to sell, thus dragging the successful competitors still further into the mire.

"Under such circumstances an amalgamation must include the weak as well as the strong; a certain amount of the overcapitalization of the industry must be taken over by the new country, and the only problem is to keep it within moderate bounds. Much, therefore, will depend upon the way in which the properties to be acquired are valued. When this duty is left entirely in the hands of an accountant promoter, as in the Woolcombers' Association, or to an accountant acting with a committee of the vendors, as in the English Sewing Cotton Company, especially when the accountant or promoter is paid by a commission on the purchase money, there is certain to be overcapitalization, because the interest of the vendors will be solely or mainly considered. The safest plan is that adopted by the wallpaper manufacturers, where one accountant was appointed to represent the vendors, one to represent the purchasing company and one to act as umpire in case of the other two disagreeing. It is not sufficient to value the assets accurately; regard must also be had to the possibility of machinery being reduced to the scrap heap by new processes or inventions or by the more favorable location of competing plants. . . . Manufacturers have been seriously hampered by the cost of introducing new methods of manufacture. The task of reconciling the temporary interest of the vendor in getting a good price for what he sells and the permanent interest of the amalgamation in securing the properties at their real value to the industry is the hardest which can fall on the organizers, since it is next to impossible to say in which particular works the unnecessary capacity resides.

Measuring the Value of a Firm.

"The value of a firm may in part be measured by its ability to earn actual profits, and this is not to be measured merely by the cost value of the plant and buildings, but by the reputation of the firm, its connections, its trademarks and patents, all the elements which go to make up good will. This is an undoubted asset, but one of a particularly elusive character. It is here to-day and gone to-morrow. The value of a concern making proprietary articles consists very largely of reputation, of good will, but it may be destroyed in a few weeks by a substitute which captures the fickle popular favor. On the other hand, the estimation of some old-estab-

* By Henry W. Macrosty. Publishers, Longmans, Green & Co., London and New York.

lished goods is so firmly rooted that it appears unshakable. So long as a firm is doing well it can carry a heavy amount of good will, but if things go unfavorably the potentiality of making future profits rapidly runs down to zero.

"A large amalgamation is at its formation particularly liable to overcapitalization, for each individual vendor, knowing how necessary it is that he should be brought in if competition is to be really eliminated, can call on the purchasing company to stand and deliver. It is only in rare instances, mostly in the iron industries, that the parties agree to neglect good will for the sake of starting the new undertaking with the least possible burden. After all, the result in personal income is the same whether a high dividend is paid on a low capitalization or a low dividend on a high capitalization, but the difficulty of financing the company in bad times is immensely greater when the nominal capital is greatly in excess of the real assets. When the parties to the combination intend to continue in close personal connection with the business they will have regard to their permanent interests and amalgamate on the basis of their real assets, but if they are voluntarily retiring, and still more if they are being squeezed out, their object will be to take their profit immediately in a high price and as much as possible in cash. The interaction of these two classes of motive will largely determine the amount paid for good will and the ultimate overcapitalization. The common opinion of business men appears to regard three years' purchase of net profits as a normally fair value of good will in most businesses. . . .

Reducing the Burden of Over-Capitalization.

"The necessary burden of overcapitalization may be reduced by good management and conservative finance. Indeed, we may, so long as it is not too great, regard it with equanimity as the price paid for the opportunity of organizing the industry and extirpating waste. By concentrating office staff, banking insurance, supervising and scientific establishments, the costs of management may be reduced; by closing small, badly equipped or unnecessary works and transferring their business to others, and also by concentrating certain classes of work in particular mills specialized for the purpose, the machinery can be kept running full with much economy in manufacture; by combining the selling businesses of the different firms savings can be made in travelers, agents and advertisements, or with the same expenditure and staff the work of individuals can be specialized and the market more thoroughly exploited; by the creation of a proper statistical department the weak points in the organization can be promptly detected and a keen spirit of emulation maintained among the several branches. On the other hand, these changes must be carried out judiciously and not too quickly, to avoid dislocation of trade. Where these improvements are attained the economies realized will enable the overcapitalization to be written off, whether it takes the form of good will or closed works. The early years of an amalgamation should, therefore, be characterized by conservative finance, by generous allocations to depreciation, especially of good will, closed works and patents, and by the building up of a substantial reserve, and they ought to be judged more by their conduct in these respects than by their dividends. . . .

"With such limited powers over prices an amalgamation is thrown back on its own inherent capacities as an administrative method. Unless it can show that it is the cheapest and best mode of production it will fail, and it is our good fortune that this problem is being worked out in Britain free from complications of tariffs or secret railroad agreements. Success, in a word, depends upon management. It is a far more difficult thing to run an amalgamation of 20 businesses than to run these businesses separately; more complex questions of business organization arise and the functions of the supreme governors of the undertaking are of a higher order. The manager of one out of many competing businesses has to take part in a scramble for trade, the manager of an amalgamation has to provide for the supply of a whole market. A huckster may run the former, but a statesman is required for the latter.

Brains Needed to Run a Trust.

"All these points have already been brought out in superabundance in the preceding chapters and need not be further labored here. It is enough to refer to the organization of the Associated Portland Cement Manufacturers or the Bradford dyers or fine cotton spinners, and above all to the classic report of the Investigatory Committee of the Calico Printers' Association. Where brains enough cannot be found amalgamation will be a failure. In the future men must be trained for the new duties under the new organization, and between commercial universities on the one hand and on the other provision of means of advancement for the capable, such as the calico printers provide, there is no reason why we should not get the men. Rule of thumb is dead in the workshop, the day is with the engineer and the chemist, with their methods of precision; in the count-house and boardroom there is no longer a place for the huckster or gambler, the future is with the commercial statesman, whether in a large individual business or a combination.

"The short term power of terminable associations over prices appear to be greater than that of the permanent amalgamations. For one thing the definite and immediate object of their formation is to bring about an advance, and since the length of their duration is doubtful it is expedient to exploit the early loyalty of the members, and to utilize the brief space before fresh competition can be called into being. An amalgamation is an open and confessed attempt to achieve domination; an association does not thrust itself upon the public gaze but works in secret, consequently, it is not surprising that the best grounded complaints of extortionate prices are directed against the coal "rings," the boiler plate associations and similar bodies. Some particulars of these have already been given. Yet once more the warning must in justice be repeated that it is not fair to compare post-associations with prices on the bankruptcy level. Persons who have enjoyed the advantages of competition among their suppliers naturally resent a combination which deprives them of this source of profit, even though the continuance of competition threatened the existence of the industry.

Perils of a Fixed Price.

"The power which price associations, pools and selling syndicates exert over prices is exactly of the same nature as that exercised by amalgamations—the swift seizure of an opportunity for a rise, resistance to a fall and the transference of the increased cost of raw materials to the consumer. There is no long term control, and, unless the short term is judiciously applied, it leads, as the iron associations show, to resentment on the part of buyers, to fresh competition and to failure. When trade must be conducted at a fixed price large buyers lose the advantage which their large capital gives them over their competitors, and a tendency arises to meet combination with corporation or integration. For example, the Scotch shipbuilders established a co-operative factory to compete with the Rivet, Bolt & Nut Company, but it failed; Messrs. Kynoch started a soap works to free themselves from the glycerine "ring," and the London grocers proposed a co-operative soap company to fight the "soap trust." With a fixed price the large seller must also surrender his ability to quote lower than the small man, and must seek the extra profit due to his size, not from the extra trade, but by producing more cheaply. This inducement to improve his processes is, however, limited by the uncertainty as to the continuance of the price. The one case in which association directly leads to economy is when territory is divided and the competitors are thereby saved the heavy expenses for railroad transport consequent on invasion of distant markets. . . .

Protected Prices in the Retail Trade.

"The retail trades with their protected prices offer a peculiarly difficult problem. The shopkeeper asserts his right to a living profit and threatens to boycott the manufacturer who refused his co-operation, while the manufacturer, being dependent on the shopkeeper for distribution of his goods, must submit. It is true that the shopkeeper is being hard pressed on all sides by department

stores, by company shops and by co-operative societies, but the greater part of retail trade is still in the hands of the small man. The manufacturer, therefore, although he is really only concerned with getting his own price and not with what the retailer gets, cannot yet rely on the stores and companies to make good the trade which he might lose through the displeasure of the shopkeeper. It is probable that large scale distribution is winning every day, though for the want of complete statistics it is impossible to say how far the shopkeeper may be losing ground or holding his own. Anyhow, it is too risky for the manufacturer to gamble on probabilities, and, besides, many of the stores and companies compete with the manufacturer by making or having made for them proprietary articles in substitution for his commodities.

"The retailer proclaims his right to live by a trade which he himself chooses at a profit which he himself determines. This is somewhat like the extreme labor (miscalled socialist) assertion of the right to work at a trade chosen by the claimant for wages fixed by his trade union and paid by the State. In a communist state the equitable distribution of income is simple, being share and share alike; in a socialist state, where the rule is 'from each according to his ability, to each according to his needs,' the problem is more difficult, but still capable of solution. But what is the rule of equity in an individualist state, where the common welfare is assumed to arise from the clashing self-interest of individuals? We may try to get at it through the workman's claim for a living wage—enough to maintain and educate himself and his family according to the standard of his class, to provide insurance against the uncertainty of the future, and to afford the possibility of rising in the social scale. This holds good so long as he is a necessary workman, the test being that he is actually employed. But the case becomes more difficult when he is in course of supersession by a new process, and when he is thrown out of work he loses his right of choice of a trade and must appeal to the State with quite other arguments.

Retailer Unable to Appeal to a Community.

"The difficulty with the retailer is that he is unable to prove that he is necessary to a community, which may be equally well served by a co-operative store or a multiple shop company. The sole interest of a community which consists mainly of employed and not of employing classes is in good service, not in the maintenance of any special class to perform that service. The possibility of the enhanced profits of the employer might flow over them in increased wages and salaries is too remote, and is quite as probable under some other system of organization. The problem at present is not a moral one, but one of comparative strengths of competition. The retailer is within his rights in his efforts at self-preservation, but with society organized on its present basis no appeal to the pity of the community can be entertained. The same claim would have availed for the passing of a law for the destruction of power looms in the interest of the hand weavers.

"The special feature of the retailer's claim to a living profit is that it takes the form of a claim to a specific rate of profit on his turn over, irrespective of its rapidity, and thus he is led to reject the ordinary device of attracting trade by reducing prices in order to gain a larger income at a lower rate. For example, a shopkeeper who sells at a profit of 25 per cent. and turns over his capital four times a year doubles his capital annually, but if he sells at a profit of 20 per cent. and turns over his capital six times a year he will make in 12 months a profit of £120 instead of £100. Even if allowance be made for increased shop expenses a surplus of profit will remain, for business charges will not increase proportionately. If quality be maintained the interest of the community is in cheapness, and his action, therefore, appears to be antisocial. Of course, profit will not indefinitely increase with the reduction of price, but the retailer takes it upon himself to declare arbitrarily when a reduction is no longer possible, although some larger business, such as 'the stores,' has shown that with large scale distribution it is possible. The maximum profit also may be produced by several combinations of profit per unit and total quantity sold, and, while any one of these will satisfy the retailer, the community regards as the best service that which produces the widest distribution of goods. At the same time there is no reason why the shopkeeper alone should bear the risk of experiment. The only equitable determination of price is made when the burden of mistake falls on those who ultimately profit—that is, the consumers—and that can only be done through a co-operative society, which implies the preliminary elimination of the retailer. . . .

Crude Methods of Trust Suppression Are Wrong.

"Nothing could be more fatal than in a panic to try to turn back a great industrial movement. So far as can be seen the great amalgamations are the best instruments of production yet devised, and to break them up into their original components would be foolish if it were not in most cases impossible. Crude methods of suppression are always wrong, nor does it seem sensible to search among legal principles relevant to a different stage of industry for weapons to hamper and obstruct. Lord Justice Bowen said in the Mogul case: 'Nor is it the province of the judges to mold and stretch the law of conspiracy in order to keep pace with the calculations of political economy.' Repressive legislation could only affect the outward form of combination. Amalgamation cannot be prohibited without forbidding the union of even two firms, while to make monopoly illegal would be fruitless where no formal monopoly exists, and there is no way of determining the greater effectiveness for evil of a merger, including 80 per cent. of the trade over one containing only 50. No law can suppress the gentlemen's agreement, where there are no rules, no constitution, no contract, but common action is effected verbally and informally, and yet some of the most oppressive combinations have been of that form.

"Neither combination nor agitation should be driven underground, and it is significant that to-day complaints are generally raised in the United Kingdom, not against the legally recognized amalgamations, but against associations which have no existence in the eyes of the law and work in secret. To strike at the methods adopted by combinations is not easy without at the same time repressing measures blamelessly adopted by the individual trader. Boycotting, dumping, selling at a loss to crush competition, maintaining prices at the highest level which the market permits, these are no monopoly of combinations, but are weapons in everyday use by manufacturers, merchants and shopkeepers. It would be indeed an extraordinary thing to strike at competition in the name of the competition." . . .

The Terry Steam Turbine Company, Hartford, Conn., has secured the order for eight 300-hp. steam turbines for the new Waterside plant of the New York Edison Company, Thirty-ninth street and First avenue, New York. These turbines are to be used direct connected to centrifugal pumps, and are for boiler feed purposes. The capacity of each turbine pump unit, will be 1000 gal. per min., against a pressure of 300-lb. This is probably the largest order for turbine driven centrifugal pumping machinery for boiler feed purposes ever placed. It has been claimed that centrifugal pumps were not suitable for boiler feed purposes, but the New York Edison Company did not place this order until after it had used three of the Terry turbines for the same purpose for a year, so that the placing of this order is practical proof of the success of the turbine driven centrifugal pump for boiler feed purposes.

An interesting use of paper is in the making of gas pipes. Manila paper cut in strips, as wide as the length of the pipe to be made, is put into a receiver filled with fused asphalt, and rolled solidly and uniformly around a rod or core of iron until the desired thickness is obtained. After the pipe, thus produced, has been submitted to a heavy pressure, the exterior is covered with sand, and the whole cooled in water. The core is then removed, and the outer surface covered with a waterproof product.

An English Community of Interest.

John Brown & Co., Limited, and Harland & Wolff, Limited.

The cable has brought a report, which shows internal evidence of its inaccuracy, that "nine big companies, headed by Vickers' Sons & Maxim, and including John Brown & Co., Limited, which recently was amalgamated with the Harland & Wolff Company, have absorbed 36 previously independent concerns, which will give them control, it is estimated, of about 90 per cent. of the steel produced in Great Britain." The report goes on to state that "the other firms included in the combination are Cammell, Laird & Co., the Northeastern Steel Company, the Weardale Steel & Coal Company, the Dorman & Long Company, Guest, Keen & Nettlefolds, the Baldwin Company and Stewarts & Lloyds Company." Dorman & Long already control the Northeastern Steel Company. While there may be some truth in the general consolidation referred to, the details thus far presented are certainly inaccurate.

What has happened is that there has been a close alliance between John Brown & Co., Limited, the great Sheffield concern, and Harland & Wolff, Limited, of Belfast, Ireland, the famous shipbuilders, who, it will be remembered, have a special arrangement with the International Merchant Marine Company for the repairs to its ships and for the construction of additional steamers.

The firm of John Brown & Co. dates back to 1854, but it was not until 1899 that it went into shipbuilding by acquiring the works and business of the Clydebank Engineering & Shipbuilding Company, Limited, which had succeeded the well-known firm of J. & G. Thomson, Clydebank. In 1902 the company acquired seven-eighths of the ordinary shares of Thomas Firth & Sons, Limited, Sheffield, and thereby enlarged its scope of supply of shipbuilding material. In 1905 the directors acquired one-half the shares in the Coventry Ordnance Works of Cammell, Laird & Co., Limited, and thus a "community of interests" was established with that firm, which includes the old Sheffield works of Wilson, Cammell & Co., the shipbuilding plant of Laird Brothers of Birkenhead, Liverpool, and the old shipbuilding plant of John Elder & Co. of Fairfield, later known as the Fairfield Shipbuilding & Engineering Company.

The announcement is now made that the directors of John Brown & Co., Limited, "have provisionally completed the purchase of a valuable field of ironstone with two blast furnaces at Frodingham, and with a view of strengthening the shipbuilding connection the company has arranged for the acquisition of an interest in the firm of Harland & Wolff, Limited, of Belfast." The capital of John Brown & Co., which is now £2,200,000, is to be increased by 100,000 preference shares at £10 each and 500,000 ordinary shares of £1 each.

The purchase of the Frodingham property is significant. The Frodingham ores, though lean, are very cheaply mined, and are almost ideal for the basic process. The statement has been made by the best of authority that pig iron is more cheaply made at Frodingham than anywhere in the world, not excluding certain Alabama plants or Ilsede, in Germany, which usually claim that distinction.

The new plant of the United States Cast Iron Pipe & Foundry Company at Scottdale, Pa., was placed in operation last week. It is said to be the largest single plant in the world devoted to the manufacture of cast iron pipe. It is built principally of reinforced concrete, the main structure being 650 ft. in length by 123 ft. in width. One of the pipe cleaning sheds is 350 ft. in length. The most modern improved machinery has been installed, and the plant is being operated throughout by electricity.

A unique method of transporting a boiler was resorted to in the case of one sent to New Mexico by the Kingsford Foundry & Machine Works, Oswego, N. Y. The boiler was of the cylindrical marine type, designed for 150 hp., and the roads were so soft that they would not support wagons with such a load. By rigging a pipe through the furnace for an axle the boiler rolled 9 miles over and around the mountains.

May Exports and Imports of Iron and Steel.

The May report of the Bureau of Statistics of the Department of Commerce and Labor shows that the exports of iron and steel decreased in May as compared with April, while the imports increased. The total value of the exports of iron and steel and manufactures thereof, not including iron ore, was $14,593,643 in May, against $17,684,683 in April, while the corresponding figures for imports were, respectively, $4,520,103 and $3,723,176.

The exports of commodities for which quantities are given totaled 91,513 gross tons in May, as compared with 132,332 tons in April and 112,758 tons in March. The following table gives the exports of these commodities for May and for the 11 months ending with May in 1907 and 1906:

Exports of Iron and Steel.

	May.		Eleven months.	
	1907.	1906.	1907.	1906.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	7,342	5,456	79,043	52,868
Scrap	5,815	899	20,207	9,234
Bar iron	1,184	6,579	39,949	38,654
Wire rods	552	454	9,573	6,186
Steel bars	8,081	2,563	44,532	19,990
Billets, blooms, &c	7,305	23,053	109,981	255,961
Hoop, band, &c	195	637	5,467	4,719
Steel rails	11,726	37,789	272,683	319,830
Iron sheets and plates	2,924	858	27,158	8,864
Steel sheets and plates	8,954	9,291	90,660	72,005
Tin and terne plates	2,089	2,574	8,086	10,420
Structural iron and steel	9,838	7,266	113,637	85,949
Wire	10,848	18,751	149,514	148,738
Cut nails	653	374	7,206	6,164
Wire nails	3,075	4,723	36,352	41,180
All other nails, including tacks	279	651	5,930	4,042
Pipes and fittings	10,653	15,171	115,691	138,788
Totals	91,513	137,089	1,135,669	1,223,622

The considerable decrease in May exports was mainly due to the diminished exports of steel rails. In April the exports of steel rails were 40,012 gross tons, while in May, as shown above, these exports were but 11,726 tons. Several other items showed a falling off which assisted in making the less favorable showing for May.

The imports of commodities for which quantities are given aggregated 85,362 gross tons in May, as compared with 74,495 tons in April. The increase was due principally to a larger importation of pig iron. Imports of these commodities for May and for the 11 months ending with May in 1907 and 1906 were as follows:

Imports of Iron and Steel.

	May.		Eleven months.	
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
	1907.	1906.	1907.	1906.
Pig iron	66,276	28,848	519,961	248,884
Scrap	3,071	1,399	17,725	25,320
Bar iron	3,034	1,072	34,278	33,566
Rails	23	757	3,947	9,246
Hoop, band, &c	296	2,324	4,364	10,937
Billets, bars and steel in forms n.e.s	1,461	1,595	17,617	17,368
Sheets and plates	164	365	3,188	2,618
Tin and terne plates	7,874	4,962	59,749	49,479
Wire rods	1,774	904	16,304	16,350
Wire and articles made from	1,218	604	8,221	4,079
Structural iron and steel	171	2,762	9,096	33,134
Totals	85,362	45,592	694,450	450,981

The exports of all kinds of iron and steel and manufactures thereof, not including iron ore, were valued at $164,304,212 in the 11 months ending with May, as compared with $146,899,982 in the corresponding period of the previous year. Similar imports for the same periods were valued, respectively, at $37,315,606 and $26,156,365. The imports of iron ore in May were 136,266 gross tons, as compared with 137,605 tons in the preceding month, while the total quantity imported for the 11 months ending with May was 1,026,209 gross tons, against 888,469 tons in the corresponding period of the previous year.

New Publications.

The Handy World Atlas.—Publishers, Frederick Warne & Co., 36 East Twenty-second street, New York. Cloth. Size, 4 x 6 in. Pages, 160. Price, 40 cents; by mail, 45 cents.

This is a most convenient volume for ready reference. It contains complete maps of the world, the principal countries being given in sections, so that the geographical features are in much fuller detail than would be thought possible in a volume of such small size. The maps cover the first 120 pages. The remainder of the book is devoted to a gazetteer of the world, which is remarkably comprehensive.

The Manual of Statistics.—Publisher, the Manual of Statistics Company, 20 Vesey street, New York. Pages, 1064. Price, $5.

This is the twenty-ninth annual issue of a work which has won for itself high standing as a reference publication for those who are interested in railroad and industrial corporations of the United States and Canada, Government securities, mining stocks, grain, cotton, &c. The present edition also devotes much attention to the newer mining companies, whose stocks have become such a feature in the stock markets of the country. Its arrangement is such that reference to the contents of any section is easy and satisfactory.

The Railroad Situation in the United States.—By L. W. Serrell, M. E. Publisher, the Moody Corporation, 35 Nassau street, New York. Cloth. Pages, 42. Price, $1; by mail, $1.10.

This book analyzes the causes of the exceptional demands which have been made upon investors by the railroads during the current year for additional capital. The railroads of the country are considered in groups and diagrams are introduced which graphically present variations in leading features connected with their operations. Suggestions are made pointing out lines upon which beneficial legislation may be indicated. A strong plea is made that such legislative action will be taken as will add to the confidence of the business world and the general stability of prosperity.

Directory of Directors in New York.—Publisher, the Audit Company of New York. Price, $5.

The Audit Company of New York has just issued the ninth annual edition of the Directory of Directors, a book which has long since proved its value and its accuracy. It contains the names of over 25,000 directors, each director's name being followed first by the name of the firm or company with which he is directly associated and then by all the companies in which he is a director.

The Operation, Care and Repair of Automobiles.—Edited from the files of *The Horseless Age*, by Albert L. Clough. Size, 6 x 9 in.; pages, 343; illustrations, 158. Cloth. Price, $1.10. Publisher, *The Horseless Age*, New York.

"It fills a long-felt want" is such a hackneyed expression that the reviewer uses it only under compulsion, for it is undeniably applicable to the above book. It is a fact that very little has yet appeared in book form that is useful to the mechanically inclined owner of an automobile. Those who are systematic enough to file away clippings that may be valuable to them generally find themselves well rewarded, and if they have so preserved little items of information concerning automobiles they may have a scrapbook nearly as useful as this book. The compilation offered here has done away with the drudgery, however, and any one who has not taken the trouble can be just as well off as his more frugal brother if he possesses it.

Its very first pages deal with that most prolific source of trouble in an automobile, the ignition apparatus. To the layman and even to the expert it is often a subtle mischiefmaker and can mean very exasperating delays at times. Beginning with first principles, it explains enough of the fundamentals of electricity and magnetism to make intelligible how the igniting is accomplished in gasoline engines. Then spark plugs, timers, dry batteries, storage batteries and magnetos are dealt with, and the complaints they are subject to—their symptoms and remedies—are very practically explained.

The next most baffling problem in connection with an automobile is in the fuel supply, and the succeeding division of the book is devoted to this subject—carburation. Gasoline is a thing to be respected, and the rules here given for its safe handling and storage should be committed to memory. When the reader has mastered these first two chapters he is in a fair position to gloat over an unruly machine, for the remainder of its anatomy is for the most part capable of inspection and its ills are susceptible to the surgery of the wrench, screw driver or hammer. The third chapter, dealing with lubrication, may be said to prescribe the proper diet and needs to be thoughtfully studied, for if an automobile is fed with the right oils its length of life is extended and many chronic disabilities may be avoided.

An automobile is very like a child, for after its bodily welfare is taken care of, its clothing and washing need attention. It must be kept shod, and in that respect it is nearly as expensive as a 10-year-old boy. Quite a little money saving knowledge is to be had from the chapter that covers tires, and the succeeding one on the inspection, care and use of motor cars. The home and bath form the substance of the next chapter, which the editor gives the more dignified title, "Garaging, Washing and Shipping Cars," and many handy hints are here found, as well as in the following division under "Repair Suggestions."

The enthusiast who would be independent of the seasons will be interested in the section on the winter use of automobiles, and all will value the concluding pages giving useful charts and tables. The entire book deserves to be studied from cover to cover, and is so nicely broken up into short articles, each complete in itself, that it may be read at odd moments of leisure without losing the continuity of the plot. A very complete index at the back makes it easy to locate a special part at any time it may be wanted, and if the book is carried in the tool kit it may shorten the time lost because of a breakdown. However, it is advisable not to leave the reading of any part until circumstances make it necessary. It is much better in any case to have the information in one's head than to hunt it under the stress of an emergency.

The Technical Year-Book, 1907.—Edited by Arthur C. Kelly, Assoc. Mem. Inst. C. E., and Charles Weekes. Size, 4 x 6 in.; pages, 399. Cloth, 5 shillings; leather, 6 shillings 6 pence. Publishers, Percival Marshall & Co., London, England.

The Technical Year-Book is in some respects similar to an engineer's pocketbook. It collates the information of a character belonging to a pocket book as drawn from the technical periodicals of the world for the year preceding, but does not pretend to be a complete guide or index to such publications. Mainly it is composed of tables, diagrams, formulæ and useful items of information, such as are of permanent value and general interest. Its contents are divided under the following headings: Automobiles, Boilers and Steam Generation, Cables and Power Transmission, Electricity Supply, General Electrical, General Mechanical, Generators and Motors, Hydraulics, Lighting, Marine, Mining, Power, Prime Movers, Traction, and General. Each section is followed by a blank page for memoranda, wherein may be entered or pasted such supplemental notes as the user may care to retain. An index at the rear locates the several subjects treated. Made in convenient desk or pocket size, it is far more handy than a scrap book, and more complete than the average engineer would have time to compile or enough papers available to take clippings from. The matter is compressed as much as is expedient, but without editing the original, and sources are indicated so that those interested may refer to the full treatments from which they were taken. In this respect the book somewhat resembles an engineering index, from which have been eliminated all references to articles of a local or tempo-

rary interest. Taken as a whole, it gives an idea of one year's progress in engineering activity, of which a condensed summary is presented in the preface. The latter calls attention to a list of the existing single phase traction lines, which is believed to be the first ever published.

The Engineering Index Annual.—Year 1906. Edited and published by the *Engineering Magazine*, New York and London. Size, 6⅜ x 9¼ in.; pages, 412. Cloth. Price, $2.

Readers of the technical and engineering journals are for the most part familiar with the engineering index published monthly in the *Engineering Magazine*. This annual is a rearranged compilation of the installments which appeared during the year 1906. The more important articles which have appeared during the past year in 250 journals in six different languages are indexed, the items indicating the scope and purport of each article, the publication in which it appeared, and a number by which persons interested may order a copy of the issue containing the full article. In this way the index is a key to the vast mass of information contained in engineering periodicals, and available in the various reference libraries maintained by engineering societies, universities, and some general libraries the world over.

Heretofore the bound volume has been issued every five years, and the classifications were strictly alphabetical. In the annual the same classification is retained as is used for the monthly installments, for example, by groups as follows: Civil Engineering, Electrical Engineering, Industrial Economy, Marine and Naval Engineering, Mechanical Engineering, Mining and Metallurgy, Railroad Engineering, and Street and Electric Railroads, with various subheadings under most of these main divisions, and the several references under each subheading alphabetically arranged. The new scheme reduces the labor of compiling the bound volumes, making it feasible to issue annually, and while it is in a measure an experiment so to do, it is believed that the plan will be appreciatively received, inasmuch as yearly issues will be fresher and more valuable for that reason.

The index was originally started in 1884 by the late Prof. J. B. Johnson in the *Journal of the Association of the Engineering Societies*, and was taken up by the *Engineering Magazine* at the end of 1905. The previous volumes were published, respectively, in 1892, 1896, 1901 and 1906.

Rowell's American Newspaper Directory.—A description of all the newspapers and periodicals published in the United States and Territories, Dominion of Canada, and Newfoundland, and of the towns and cities in which they are published, together with a statement, or estimate, of the average number of copies printed by each publication catalogued. Thirty-ninth year. Published by the Printers' Ink Publishing Company, New York. Subscription price, $10. Size, 5 x 8 in.; pages, 1559.

The nature of this directory, in the words of its title page, is given above and is a sufficient review for a book so well known. The directory is divided into four parts. Part I contains a catalogue of all American periodical publications, arranged alphabetically by States, towns and their names. Part II consists of a list of all publications rated in Part I as issuing regularly more than 1000 copies. Part III consists of a complete list of papers issued on Sunday, and Part IV consists of a complete catalogue of class and trade papers.

Instead of commenting further upon it or its purpose, the following gives some interesting facts drawn from its records concerning American periodicals. There are listed in this, the thirty-ninth consecutive annual edition, nearly 23,000 papers, or, to be exact, 22,898. Of these, 21,735, or about 95 per cent., are published in the United States. New York State has the greatest number of papers, 1984, and the next five States in order are Illinois (1634), Pennsylvania (1387), Ohio (1137), Iowa (1047) and Missouri (1037). By far the greatest number of papers in each case are weeklies, the total being 16,252, or about 71 per cent., of all papers published. Monthlies form the next largest class, representing about 12.6 per cent. Thereafter in order follow dailies, 10.8 per cent.; semiweeklies, 2.6 per cent.; semimonthlies, 1.3 per cent.; quarterlies, 1 per cent., and the remainder bi-monthlies, tri-weeklies, bi-weeklies, tri-monthlies and one semiquarterly, the only one listed, which is published in Illinois. Very closely the same proportions exist in the States taken separately. New York and Illinois, principally because they contain the two largest publishing centers, New York City and Chicago, have the largest number of papers in each class, the weeklies, for example, being 1054 for Illinois and 1034 for New York. Of all the papers published, it is interesting to note that not one-quarter distribute as many as 1000 copies a year.

The Growing Importance of Copper Imports.

The trade does not give adequate attention in the study of copper statistics to the growing importance of the imports. For the first 11 months of the fiscal years, 1906-1907 and 1905-1906, the Bureau of Statistics reports:

	Copper imports 11 months.	
	1906-07.	1905-06.
	Pounds.	Pounds.
Fine copper contracts of ores and mattes	50,870,576	48,960,291
Bars and ingots and old copper	184,413,901	156,410,570
	235,284,477	205,370,861
Re-exports of foreign copper	1,524,195	1,081,670
Net imports	233,760,282	204,289,191

While there has been quite a considerable increase, therefore, in the imports, there has been a serious decline in the exports, and these taken with the imports, as above, reveal the following position:

	Copper movement, 11 months.	
	1906-07.	1905-06.
	Pounds.	Pounds.
Exports of ears, &c.	373,239,752	424,900,059
Imports	233,760,282	204,289,191
Excess of exports	129,471,470	220,610,868

In other words, the copper consuming interests of the United States have been called upon to absorb about 91,000,000 lb. more of copper during the 11 months ending May 31, 1907, than during the 11 months ending May 31, 1906.

One factor, however, needs to be considered. There is a considerable export movement of ores and mattes produced in this country to Mexico, and to British Columbia where the smelters treat them, usually, however, returning the copper to this country. The Bureau of Statistics does not report the copper contents of this material. We believe, however, that the net copper contents involved would not show any considerable difference, and would not therefore appreciably affect the net result which, after all, is that the copper consuming interests took care of 91,000,000 lb. more in the last fiscal year than in the preceding one. Huge as are the requirements of our country, that is not a negligible quantity and more than offsets the proportion of any lessening of the output during the first six months of the current calendar year as compared with the first six months of 1906.

At the rate of consumption since June 1, 1905, the home trade has absorbed the metal. It has taken a much larger proportion of the total enormous production of the country, which is proved by the fact that prices reached an abnormal level, and have been held at it by natural forces. But it remains to be seen whether consumption can possibly cope with such quantities at such extraordinary prices, in the face of admitted slackening of general business, due to the difficulty of raising money for new enterprises.

Copper at 20 cents a pound will not shut down a single mine. Will it stimulate consumption so as to take care of the increased quantities of copper which will steadily appear in the markets as one by one the new mines become sellers of copper, and the older mines get their extensions and additions into shape?

The first piece of steel on the new Manhattan Bridge over the East River, New York, was placed in position June 26 on the Manhattan anchorage.

THE IRON AGE

1855-1907.

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Have the Copper Mining Companies Pursued a Wise Policy?

It is evident from the annual reports of a number of the leading copper mining companies that they have followed the principle during the period of high prices of mining and treating ores lower in grade than usual. Some of the managers have been rather proud of this course, which has appealed to many and has been accordingly applauded. In times of high prices it pays to handles ores which it would be folly, from an economic point of view, to extract in times of normal values. The managers of a mining property are therefore prolonging its life and are more thoroughly utilizing nature's bounty. For many decades in the history of American mining foreign experts were pretty unanimous in pronouncing us "robbers" of our mineral resources, and it is certainly true that there was a great deal of reckless waste. The reproach was justified even when due allowance was made for the fact that costs were much higher than they are now, and mining and metallurgy had not made the progress to which our American engineers contributed the lion's share.

Instead of greedily ripping out the most accessible and the richest ores and minerals, and smelting with the main aim to get product irrespective of yield, our modern methods are largely based, particularly in the copper industry, in handling enormous masses of low grade ores at a usually close margin. Our managers of our mining industries have learned to realize that in the long run a larger total of profit may be obtained by such a course, and in times of high prices they take out ores so lean that they could not be utilized, except at a loss, in normal times.

But it may well be asked whether such a policy may not be carried too far, and there are indications that such has been the case in copper mining during the last year, if the interests of the consumer as well as those of the producer be taken into consideration. We are told, and it is undoubtedly true, that some of the large copper mining companies have during the past six months of the current year made less copper, with the same equipment, than they did last year. In other words, they have loaded up their concentrating plants and their smelters with lower grade ores. They have contributed toward creating a famine in the metal, which has caused irksome and expensive delays in deliveries to the manufacturing and consuming industries. It has caused a rise in prices which leading copper mining interests themselves have deplored as dangerous and have fought in its earlier stages.

We believe that a tactical error was made in going so far as they have. It would have been wiser, from the standpoint of their own interests, to supply the market more liberally with metal when its needs were clearly indicated, after the 18-cent limit had been passed. The consuming interests certainly have a grievance, measured by the quantity of additional copper which the mining companies could have put on the market by working the richer stopes. There is not a mining company of any consequence in the United States to whom an 18-cent copper market is not amply profitable, even when working the grade of ore which they have been treating during the last year. They could readily continue the otherwise commendable policy of treating lean ores and fully utilizing their mineral resources, after having made a deliberate and sustained effort to increase output by a temporary reversal of policy.

The Rail Duty and Rail Quality.

The shoemaker should stick to his last, says an old proverb. In discussing the rail situation a great deal of loose talk is being indulged in by railroad officials, who demonstrate that a first-class railroad man is not necessarily a well informed man on outside subjects. Among the remedies which some of them suggest for improving the quality of rails is the abolition of the tariff. This is one of the humorous episodes of an exceedingly serious subject. So far as anything in the steel line is concerned, the tariff has long ceased to be a matter to be taken into consideration, but especially so in connection with steel rails. Far in the past, when the duty on steel rails was $28 a ton and American rails were selling at nearly the foreign rail price plus the duty, the tariff was a most important commercial factor and entered deeply into trade matters. At that time this country made but a limited quantity of steel rails, and the European output was very much in excess of it. If the question of breakages of rails had then been raised there would have been some justification for American railroad managers turning their eyes toward Europe and inveighing against the tariff as the barrier which prevented them from trying to get better rails. But while at that time there was some criticism of the wearing qualities of American rails, because they were made from rolled instead of hammered ingots, the question of breakages did not come up.

The humor of the present situation is that the officials referred to apparently do not know that we have passed from our ancient position of making a small output of steel rails to the production of far more than can be turned out in the same time by all other countries in the world combined. Yet the past week a vice-president of the New York Central Railroad is quoted by the New York *Herald* as saying, "If the tariff was abolished the American made steel rail would not be used at all." That is to say, with the tariff barrier removed the railroads of this country, whose annual rail requirements are about 4,000,000 tons, would turn to foreign sources of supply utterly incapable of furnishing anything like that quantity. In the light of this statement of home and foreign rail making capacity the declaration also appears most ridiculous of a Western railroad president, who is quoted by the same journal as saying: "I think the outcome of the controversy will be the placing of orders for steel rails in foreign countries. The price of rails there is from $21 to $22, and American manufacturers compete with those prices, yet they charge us $28 and want to charge $33 for a good rail. We can better afford

to buy rails in foreign countries and pay $7.84 a ton duty." This spokesman for the railroads is not well informed on the price of rails abroad. Not for a long time has the price been so low as the figures he mentions, but in most foreign rail making countries the home railroads are paying higher prices at the present time than American rail mills are charging American railroads. Nor would American railroads have sufficient assurance that if they were to purchase foreign rails the quality of such rails would meet their requirements. Canadian railroads have reported English rails among those found broken on their lines the past winter.

It would perhaps be better for railroad officials to let their technical men do their talking. Dr. Dudley of the New York Central, for instance, thoroughly understands the foreign situation. Having been asked by a *Herald* reporter if the imported steel rail would solve the difficulty, he emphatically denied that it would and added: "The European manufacturers could not come anywhere near supplying the railroads in this country even if we needed them. I have been occupied all day in conference with the steel manufacturers and I am satisfied that next year's supply of rails will be much better." This is the sensible view to take. The American rail manufacturers have for several years had a far more strenuous experience than their European confreres, having been obliged to meet a steadily increasing demand, at the same time finding that the railroad companies were imposing heavier burdens on their tracks both in the weight of rolling stock and the great enlargement of traffic. It may well be questioned whether the European rail, which is found to be rendering excellent service in the track of a European railroad with its light trainloads, would prove any better than an American rail in the track of one of our trunk lines with its heavy trainloads. For a guarantee of a term of years the European maker would very probably exact from an American buyer a premium on the standard price.

The Rail Agitation and Car Wheel Prices.

One result of the crystallization of sentiment in favor of a better and higher priced steel rail will no doubt be a greater willingness on the part of the railroads to pay the wheel maker more money for meeting the increasingly exacting requirements of the buyer. It has been the complaint of the car wheel manufacturers that whereas railroad engineers are calling for service that can only be given by high grade chilled wheels, the purchasing agents award contracts at prices which will not pay for such wheels. The *Railroad Gazette* refers to a car wheel maker who has always maintained a reputation for turning out only the best quality of wheels, who in the past year refused orders for nearly 200,000 wheels which were to be used under 50-ton cars. The prices offered were not enough to pay for wheels of even ordinary quality, yet the orders in question were taken by other makers at the prices offered, and the wheels are now in service. This case is its own commentary on a condition that calls for united action by those in authority on the important railroads of the country. Now that the public has been supplied from railroad sources with criticism of the quality of materials furnished by steel rail manufacturers, it behooves those who have started the agitation to see that they are clear of any responsibility for the failure of the wheels that traverse the rails.

Some progress has been made in the past year toward stronger wheels. The Master Car Builders' Association's adoption of a design providing for ⅛ in. increase in thickness of flange and a change in the taper of the tread from 1 in 25 to 1 in 20 has been followed by meetings of makers and buyers. Closer co-operation in the matter of standards should lead to concerted action to secure and maintain quality, and it should result that the position of the wheel founder who makes quality a first consideration will be stronger than ever. A question the makers have been uring upon the Master Car Builders is the adoption of an equitable guarantee for 600, 650 and 700 lb. wheels, made after the new design and taking account of the increased wheel loads. This opens the way for the consideration of prices in the light of the emphasis recently put upon safety as the first consideration.

The chilled cast iron car wheel is compared, when service requirements are under discussion, with the steel wheel, whether forged, rolled or cast, yet any one of the latter represents a first cost about double that of the cast iron wheel. If it be true, as has been said, that 20 per cent. of the 20,000 wheels turned out every day in the United States are entirely unfit for service under heavy equipment, it behooves those responsible for railroad standards to insist on quality as the basis of contract awards and not the lowest price at which some wheel maker can be persuaded to take the business. Moreover, if the recent protestations of the railroads that the best steel rail that can be procured is wanted, even at a higher price, are to be taken at par, the makers of high grade wheels should find the way paved for their next approach to a long mooted question. With the public demand for safety emphasized as it never has been before, the wheel buyer must meet a responsibility going far beyond the commercial considerations that have so long dominated the manufacture and use of cast iron wheels.

The Commercial Value of Pessimism.

Of the temperamental tendencies in human nature those leaning toward optimism are without doubt greatly preponderant. Their operation, moreover, is not confined to any particular phase of life or its activities, but bears with equal force and influence upon human thought and action in every direction. The results of this optimistic tendency are perhaps nowhere more manifest than in the world of business and commerce, where the bulls are the crowd and the bears the minority. But to maintain, withal, a counterpoise of equilibrium in affairs there must always be a compensating balance, and to that end may it not be that the admixture of a certain degree of questioning pessimism is at times needful?

In illustration of this principle as applied to the conduct of business, a story is told in a recent magazine article of a prominent firm of contractors which employs a man at a salary of $10,000, the value of whose service lies in his unfaltering pessimism respecting every proposition submitted to his inspection and judgment. His whole attitude is represented as being one of interrogative suspicion. No credit, however seemingly sound, escapes his questioning scrutiny; inventory appraisements are attacked and their face values mercilessly reduced; accounts payable, regarded from his unoptimistic view point, are deemed unworthy of acceptance at face value if clouded by the faintest possible suspicion of doubt; profit balances are remorselessly whittled by a stern demand for increased depreciation of plant equipment on account of wear and tear, and the diversion of additional sums is insisted upon for the further strengthening of the sinking fund. And so at every point his unvarying pessimism is opposed to the optimism of his employers and fellow employees, who are prone to take a

brighter and more hopeful view of things. Whether the story be one of fact or is merely the product of a lively imagination, it is needless to inquire. In any event, its point is plain and of timely significance. Long periods of unusual prosperity, such as we have experienced and still continue to enjoy, are by no means productive of that spirit of critical analysis which favors a discriminating scrutiny of business details. Assets are too often computed upon a basis of values, and are made to include items that will not withstand the impact of sound financial logic. Costs of production, necessarily high, creep up by small accretions here and there in a manner that, were the need of economy felt, would not be permitted. Depreciation charges for the account of sinking funds are too sparingly made, and expansion in scope and spread of operations is sometimes undertaken to an extent unwarranted by resources at command.

If, therefore, such results are justly chargeable, as they often seemingly are, to the unbalancing effects of too great a degree of optimism, then perhaps the presence of an occasional doubter may after all exercise a needed and wholesome corrective influence. The effect should be to set green lights of caution along the routes of trade and traffic, and to insist on the observance of slow running orders over spots of questionable security.

Notwithstanding the advantages that might thus accrue from the instillation of a proper amount of pessimism in business policies, it is not likely that many lucrative posts of the kind suggested in the story will be created in financial or manufacturing institutions. For there will still be those who will endeavor to struggle along without the aid of a $10,000 pessimist.

Phosphorus in Bessemer Steel.

The growing disposition to question the desirability of retaining the old limit of 0.10 per cent. phosphorus in steels for various uses prompts the observation that the very rapid increase in the manufacture of basic open-hearth steel more than balances, for a time, the slow though steady increase of phosphorus in the ores which are being raised. Of the total tonnage of ore mined each year, a rapidly decreasing proportion finds its way into Bessemer steel, while the average phosphorus content of all relatively low phosphorus ores is increasing but slowly. The limit of 0.10 per cent. phosphorus is man's and not nature's device. Nature has placed in the ground iron ores containing a wide range of phosphorus. It is by selecting low phosphorus ores from some deposits and by mixing ores of quite different analysis that a Bessemer pig iron is produced containing about this proportion of phosphorus.

It is true that an undue proportion of the lower phosphorus ores cannot be mined without the increased cost of selection and the diversion of a larger percentage of the ore into the cheaper basic class, but within limits rearrangements of the destinations of ores of different phosphorus content can be made. An exact summary of the phosphorus content of all the ores mined is utterly impracticable. A presentation which throws some light, however, can be made by averaging analyses, irrespective of tonnage. Considering only the main standby of the trade, the Mesaba range, it can be observed from the current analysis book that excluding all ores which run more than 0.10 per cent. as much phosphorus as iron, and excluding also seven ores which run about 0.05 per cent. or less phosphorus to iron, there are left 38 ores. Dried at 212 degrees the average iron content of these 38 ores is 52.04 per cent. and the average phosphorus content 0.03913 per cent. The proportion of phosphorus to iron is 0.075 per cent. Using all these ores, or perhaps excluding a few, and giving proper attention to coke, it would be possible to make a steel by the Bessemer process running 0.08 per cent. phosphorus instead of 0.10 per cent. By further selection a still lower phosphorus content would be possible.

In present practice these ores are in the main mixed with the many ores which are just outside the limit. The increase year by year in the total tonnage of ore raised is due in large part to the greater demand for pig iron for the open hearth furnace. As more ore is raised more of the lower phosphorus ores can be taken. There is now being made a great deal of basic pig iron which is really but little outside the Bessemer limit. It is not a necessity, but only a convenience to the user, who could use higher phosphorus pig iron. A fraction of a dollar change in the market price would quite alter his ideas as to phosphorus. Indeed, standard Bessemer pig iron is not infrequently used in basic open hearth furnaces, although the tonnage involved is not large. Were there an inexorable demand for a pig iron lower in analysis than the present standard the use of somewhat higher phosphorus pig iron in these cases would readily adjust itself.

The present erection of open hearth capacity at three points by the United States Steel Corporation and at two points by the Jones & Laughlin Steel Company involves new capacity for more than 4,000,000 tons of ingots a year, and with various other new erections an annual new capacity of nearly 5,000,000 tons is in sight. The mining of basic ores for this sudden increase can readily carry with it the raising of more ores of the lower phosphorus.

There is no occasion to assume, then, that the limits which nature has placed in mixing phosphorus with iron impose restrictions upon every ton of iron or steel which is made. Rearrangements can be made, both by the adaptation of plant, as has been witnessed in the rapid growth of open hearth erection, and by the adaptation of mixtures, involving changes which in some cases could be made on a few days' notice. It would be possible, for instance, to establish two grades, as to phosphorus, in standard Bessemer pig iron, and with a rearrangement of market prices, involving separate prices for the two grades, and for basic pig iron, the trade would adapt itself with facility to the change, and all grades would find their proper channel of consumption. The iron trade has great powers of adaptation, and it needs but a little stress to bring them forth. For instance, the question of rail quality has been treated sometimes as though it were a metallurgical problem; it is purely a commercial one and will be solved on commercial lines.

The spans of the 40,000 ton Quebec bridge are so long, and the loads carried so great, that the dimensions and weights of the truss members greatly exceed ordinary practice, and require special care and very great accuracy in their construction at the bridge shops. The anchor and main spans, 500 and 1800 ft. long respectively, are divided into panels of 50 and 56 ft., with their principal members varying from 50 to 100 ft. long, and having maximum weights of over 100 tons. Many of the compression members are thus longer and heavier than single track railroad plate girder bridges of ordinary span. They are built separately at the bridge shops, and are seldom assembled until finally erected in the permanent structure, where they are handled by the traveler some hundreds of feet above the water, often exposed to severe storms, and under conditions where it is imperative that they should fit with extreme accuracy and engage together with absolute facility and precision.

The United States Cast Iron Pipe & Foundry Company's Report.

The report of the United States Cast Iron Pipe & Foundry Company for the year ending May 31, 1907, shows the following income account, as compared with the preceding year:

	1907.	1906.
Gross manufacturing income	$1,978,490	$1,938,601
Other income	133,561	114,607
Total income	$2,112,051	$2,053,208
Interest on bonds	$90,000	$90,000
Reserve for improvements	197,000	195,000
Reserve for doubtful acts	12,000	12,000
Total deductions	$299,000	$297,000
Balance	$1,813,051	$1,756,208
Dividends preferred stock (7 per cent.)	$875,000	$875,000
Dividends common stock (4 per cent.)	500,000	500,000
Total dividends	$1,375,000	$1,375,000
Surplus	$438,051	$381,208
Previous surplus	506,208	492,315
Total surplus	$944,259	$873,523
Reserve, additional working capital	162,458	267,315
Reserve for improvements	150,000	*100,000
Total extra reserve	$312,458	$367,315
Final surplus	$631,801	$506,208

* Reserve for insurance fund.

The balance sheet, as of May 31, compares thus:

Assets.

	1907.	1906.
Cost of property	$24,078,735	$24,086,735
Treasury stock at cost	347,555	347,555
Bonds and sinking funds	588,814	501,487
Raw and manufactured material	2,066,320	1,942,503
Accounts and bills receivable	3,583,965	2,781,497
Cash	575,455	834,577
Totals	$31,240,844	$30,494,354

Liabilities.

Preferred stock	$12,500,000	$12,500,000
Common stock	12,500,000	12,500,000
Bonds	1,500,000	1,500,000
Accounts payable	1,505,811	797,928
Reserve for working capital	2,459,897	2,297,439
Reserve for improvements	23,507	285,419
Reserve for insurance funds	100,000	100,000
Reserve for doubtful accounts	19,827	7,360
P. and L. surplus	631,801	506,208
Totals	$31,240,844	$30,494,354

President George B. Hayes, in his remarks to the stockholders, expresses his gratification at the results of the year, which are the best so far achieved, and adds:

"During the year the company has built a new foundry in Chattanooga, a complete new foundry in Scottdale, near Pittsburgh, which will double the capacity of that plant in pipe, and a large foundry and power house in Burlington. The extensions at these three plants will result in a material increase in the manufacturing capacity of the company, and also a reduction of the cost of manufacture. All of these expensive additions to the plant facilities of the company have been paid out of earnings, and the net profits shown by the accounts at the end of the fiscal year are made after deducting the cost of these extensions. In addition to the expenditure for the foregoing purposes, all of the plants of the company have been kept in first-class condition. The latter cost has been charged as a part of the cost of manufacture.

"You will observe from looking at the report that notwithstanding the increase in the company's manufacturing capacity, the plant account remains the same. Your directors have thus avoided capitalizing disbursements, which probably would be chargeable to the plant account. The company has not borrowed a dollar for the past three years. It has ample working capital to finance all of its necessities. It owes no money of any kind except for current accounts.

"We make no predictions for the future, but feel assured that with our increased capacity and the harmonious co-operation of employees and management, the company is in better condition to-day than it has been since its organization."

Contracts for Battleships and Armor Awarded.

WASHINGTON, D. C., July 2, 1907.—The Secretary of the Navy has awarded the contracts for the two battleships of the so-called Dreadnought class to the Newport News Shipbuilding & Dry Dock Company, Newport News, Va., and the Fore River Shipbuilding Company, Quincy, Mass., respectively. The proposals of the former company would have enabled the Government to build both vessels at much lower cost than will now be possible, but the law forbade the allotment of more than one ship to a single contractor.

In accepting the bid of the Newport News Shipbuilding & Dry Dock Company the department gives the contractor the alternative of building a vessel on the company's plans, involving the use of the Parsons turbine for motive power, with certain slight modifications suggested by the experts of the Bureau of Construction and Steam Engineering, or upon the original plans of the department, which include reciprocating engines. If the former proposition is accepted the contractors will receive $4,090,000; otherwise they will be paid $3,987,000.

Two Turbine Battleships Probable.

The bid of the Fore River Shipbuilding Company accepted by the department is based on the use of the Curtis type of turbine, the contract price being $4,377,000. It will thus be seen that if the Newport News Shipbuilding & Dry Dock Company elects to build on its own plans, which is regarded as highly probable, both big battleships will be equipped with turbine engines, which will mark a most important innovation in the American navy, no other ships of this type having been designed for turbine motors.

The Secretary of the Navy has had little difficulty in disposing of the bids submitted by the naval constructors of the Brooklyn and Mare Island Navy Yards for the construction of the two big vessels. The lowest of these bids, it is now learned, was approximately $700,000 higher than the minimum bid of the Newport News Shipbuilding & Dry Dock Company and more than $300,000 higher than the bid of the Fore River Shipbuilding Company, upon which the contract to that company has been awarded.

Armor Contracts.

After an important readjustment of the bid of the Midvale Steel Company, the contracts for the armor for the two battleships have been awarded as follows: Bethlehem Steel Company, 3602 tons; Carnegie Steel Company, 3543 tons; Midvale Steel Company, 2230 tons. These awards are made on the basis of $420 per ton for Class A armor (7956 tons) and $400 per ton for Class B (952 tons), Class C (392 tons), and Class D (76 tons). In submitting its bid the Midvale Steel Company reclassified the armor according to the mechanical difficulties to be encountered in its manufacture and quoted prices on the basis of a series of five groups. The Secretary of the Navy did not regard this as a satisfactory basis for comparisons and he therefore advised the Midvale Company that its bid could not be considered unless submitted in accordance with the Department's schedule. The proposal based on groups was then withdrawn and the Midvale Company offered to make armor at the same prices as those quoted by its competitors, whereupon a contract was awarded as above indicated. W. L. C.

Several different formulæ for rating automobile motors have recently been proposed. The Automobile Association of Central Europe has adopted one for four-cycle motors, based upon a mean effective pressure of about 55 lb. per square inch, and 900 rev. per min. This formula reads $N = 0.003\ i\ d^2\ s$, in which N is the horsepower to be determined for the rating; i the number of cylinders in the engine, and d and s the diameter and stroke of the piston. The constant is based on dimensions given in centimeters; when these are in inches it becomes 0.0492, the formula otherwise remaining the same. The output, as figured from this formula, is rather low, because the assumed mean pressure is lower than that usually adopted in computing such ratings. For a four-cylinder engine, with pistons and stroke of 5 in. each, the result would be 24.6 hp.

The Amerian Car & Foundry Company's Report.

The eighth annual report of the American Car & Foundry Company, covering the operations of the fiscal year ending April 30, 1907, shows the best financial results in the company's history. Following is the statement of net earnings:

Earnings from all sources		$11,115,087.68
Less renewals, replacements, repairs, new patterns, flasks, &c		1,768,003.64
Total earnings		$9,347,084.04
New construction charged off	$557,548.35	
Appropriation for insurance reserve	650,000.00	1,207,548.35
Net earnings		$8,139,535.69
Less dividends on preferred stock, 7 per cent	$2,100,000.00	
On common stock, 2 per cent	600,000.00	2,700,000.00
Surplus for the year		$5,439,535.69
Surplus April 30, 1906		14,113,094.12
Surplus April 30, 1907		$19,552,629.81

The general balance sheet as of April 30, 1907, is as follows:

Assets.

Cost of properties, plants, &c., to April 30, 1906	$59,371,979.44	
Add for new steel car plant at St. Louis, Mo.; extensions to other plants, and additional real estate	2,929,530.51	
For amount reserved for balance on plant at Wilmington, Del	250,000.00	$62,551,509.95
Current assets:		
Materials on hand, inventoried at cost or less, about 85 per cent. of which will be used on cars we have contracts to build	$19,002,795.03	
Accounts and notes receivable	18,464,543.28	
Stocks and bonds of other companies, at cost or less	844,337.53	
Cash in banks and on hand	3,322,309.44	41,633,985.28
Total		$104,185,495.23

Liabilities.

Preferred stock		$30,000,000.00
Common stock		30,000,000.00
Current liabilities:		
Audited vouchers for material not yet due and loans payable	$21,827,010.79	
Insurance reserve	774,002.20	
Reserve for payment of purchase price of Wilmington, Del., plant	500,000.00	
Pay rolls (paid May 10, 1907)	706,852.43	
Dividend No. 33 on preferred stock (payable July 1, 1907)	525,000.00	
Dividend No. 19 on common stock (payable July 1, 1907)	300,000.00	24,632,865.42
Surplus account		19,552,629.81
Total		$104,185,495.23

The following is a statement of the company's working capital:

Working capital, April 30, 1906		$14,741,114.68
Add surplus earnings for the year ending April 30, 1907	$5,439,535.69	
Less expended for new steel car plant at St. Louis, Mo.; extensions to other plants, and reserved for balance on plant at Wilmington, Del., included in property account	3,179,530.51	2,260,005.18
Working capital, April 30, 1907		$17,001,119.86

The gross business for the year was $100,906,296, an increase of nearly $31,000,000 over the previous year. President F. H. Eaton's report says this increase of over 30 per cent, does not nearly represent what might have been shown had it been possible to obtain materials in time for the requirements of the plant. He says:

"There is no doubt whatever that we could have constructed at least 25 per cent. more cars if these conditions had not prevailed. The total number of freight cars built during the year was 93,861, against 72,757 in 1906, and the number of steel cars constructed passed the number of wood for the first time."

The old directors have been re-elected, with the exception of W. J. McBride, who was succeeded by A. Barton Hepburn, president of the Chase National Bank. William M. Hager, formerly assistant secretary, was elected secretary to succeed D. A. Bixby, and Clarence Price was elected a vice-president.

Central and South American Notes.

SAN JUAN, CENTRAL AMERICA, June 11, 1907.—A fair idea of the progress of Argentina is found in the activity of the railroads, which last year transported 15,030,044 passengers and 3,926,694 tons of merchandise. In 1904 Buenos Ayres had 979,318 inhabitants, and now has 1,025,653.

A supplementary agreement has been signed between Chile and Bolivia for the construction of the Pacific & La Paz Railway, the capital for which is mostly British, and is guaranteed by Chile. Branch lines will run to the rich Potosi silver mines and to the gold and copper mines of the north.

A line is also projected through Matto Grosso and Brazil. This would open up the rubber, tobacco and fruit regions. Argentina intends to reach the same regions by a north and south railroad to parallel the Paraná and partly the Paraguay rivers.

A great deal of loss has been incurred, due to the strikes of stevedores in Buenos Ayres and Valparaiso, but in both cases the Government has now reached a settlement.

The hostilities started by Nicaragua and continued in Honduras, Salvador and Guatemala, bid fair to continue for quite a time. No sooner do two of those countries agree than trouble with another breaks out. Business in Central America is now in a chaotic condition, many foreigners and natives having left for more peaceful regions.

Repairs on the Tehuantepec Railway have continued actively since the late earthquake. A large amount of material, cars, &c., is arriving through the ports of Coatzacoalco and Salina Cruz on the Pacific. It is said that Chilpancigo and several of the other cities ruined by the earthquake will rebuild mostly with iron and steel, following the example of Salvador. A good part of this material is to come from American factories.

The boundary question between Costa Rica and Panama is apt to cause friction; the treaty had already been agreed to and signed, but the Costa Rica Legislature would not accept it.

The Northern Railway, the Puerta Cortez and the branches of the Central Railway have all suspended work, due to the revolutions in Guatemala, &c. Much distress prevails.

Peru is trying to push its railroad system through the Andes region, to tap the new gold and copper mines found near the sources of the Amazon. A concession has also been given to navigate several of the rivers, to run lines in connection with the steamers on the Amazon. European capitalists are investigating the old Madeira-Mamoré project, which the American, Colonel Church, planned. It is proposed to reach the valuable rubber forests of Bolivia by this means. At the junction with the Amazon rapid steamers would be put on that river to run to the Atlantic or perhaps as far as Pará.

Two new German lines of railroad are projected from Porto Alegre and Santa Catherine to the interior of Rio Grande. C.

Interesting Applications of Gas Producers.—The Industrial Gas Company, New York City, has recently contracted to furnish a 600-hp. Harvey anthracite gas producer to the Albany Chemical Company, where it will be used principally for heating rotary vats in connection with the preparation of chemicals, and also to operate a small gas engine. The equipment will include an updraft generator, an economizer for reheating air and generating steam for gas making, a wet scrubber for cooling and cleaning the gas and a dry scrubber for drying it. This installation is principally interesting because it is the first in connection with this class of work in the chemical industry. The same company will install eight 12-ft. Herrick generators for raw bituminous producer gas, to be used in connection with glass melting, at the works of the American Window Glass Company in Hartford City, Ind.

The Wm. Cramp & Sons Ship & Engine Building Company's Report.

The report of the Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia, for the year ending April 30, 1907, makes the following showing of net earnings as compared with the previous year:

	1907.	1906.
Net profits	$328,328	$704,724
Fixed charges	324,920	333,752
Surplus for year	$3407	$370,972

The general balance sheet as of April 30, 1907, compares as follows:

Assets.

	1907.	1906.
Real estate, machinery, &c.	$12,971,014	$12,877,438
Bills and accounts receivable	1,577,300	1,791,541
Materials and supplies	823,620	645,378
Cash	186,881	167,126
Claims in process of adjustment	1,068,368	1,080,767
Totals	$16,627,184	$16,562,249

Liabilities.

Capital stock	$6,098,000	$6,098,000
Bonds and mortgages on real estate	6,319,912	6,505,212
Wages, bills and accounts, bond interest, &c.	963,521	694,772
Surplus	3,245,750	3,264,265
Totals	$16,627,184	$16,562,249

President Henry S. Grove makes a statement to the stockholders from which the following extracts are taken:

"We much regret that the result of the shipbuilding branch of our corporation reflects the extremely unsatisfactory condition of the shipbuilding industry on the Atlantic Coast, referred to in our last annual report. During the year there have been further advances in the cost of material and labor, thus practically eliminating the small margin that close competition compelled us to accept.

"The I. P. Morris Company has had a busy and very prosperous year. In its water turbine and engineering work there is more business offered than it can undertake, and the orders in hand are quite sufficient to keep it actively employed for the next 18 months. To meet this demand we have extended our foundry building, and were obliged to make other improvements.

"Our subsidary companies and departments other than shipbuilding have had a most successful year. The corporation is energetically developing their resources and possibilities.

"Since the closing of our accounts on April 30 the United States Supreme Court has on technical grounds reversed the favorable decision of the Court of Claims, in our suit for expenses incurred in taking care of the battleship Indiana in 1890-1896, while the Government was experimenting with armor plate, the delay in the delivery of which necessitated the actual outlay of money directly and indirectly. The Court of Claims had allowed us $135,560. Our counsel are quite confident of winning on their next case, the Massachusetts, with the Brooklyn, Iowa, New York and Columbia still to follow."

At the close of the company's fiscal year it was at work on three vessels for the navy and seven for private owners. The naval vessels ran from 13,000 to 16,000 tons each, and the private vessels from 3400 to 6350 tons.

Morris centrifugal pumps operated by Westinghouse motors are to give the city of Mexico a modern water supply system. The five stations will have a total normal capacity of 3060 hp., capable of an overload capacity up to 5220 hp. Synchronous alternating current motors varying in size from 60 to 1200 hp., operating at 3000 volts, reduced from a line pressure of 18,000 volts by transformers, provide the powers, and are said to include the largest electric motors ever installed in Mexico. The total capacity of the pumps is 7350 liters of water per second, which amounts to about 150,000,000 gal. per day. The pumps are of the single impeller centrifugal type and, as the heads vary considerably in the several stations, the pumping capacity per unit of power also varies from 0.71 liter per second per horsepower to 5.83 liters. The layout of the stations is most complete, the pumps with their motors being set in special masonry tanks below the water level, so that the pumps are always primed. Water will be pumped to reservoirs near to and above the city level.

The Steel Rail Conference.

At the invitation of Chairman E. H. Gary of the United States Steel Corporation, a conference was held in New York on June 27 which was attended by officers of a number of leading railroads and representatives of rail making companies. The following statement regarding the result of the meeting was made by Judge Gary:

"A meeting was held at 71 Broadway to consider the character, quality and usage of steel rails. There were represented by presidents or vice-presidents nearly all of the railroad systems of this country and Canada, and all of the manufacturers of rails of both countries. The importance of producing and using at all times a rail capable of meeting the requirements of traffic, however great, was recognized by all; and both the railroad officials and manufacturers discussed the various suggestions which have been made in that direction. The meeting was in every respect harmonious and friendly.

"It was decided to request the joint committee of experts heretofore appointed by the American Railway Association and the manufacturers of rails, respectively, to report their conclusions for consideration at an adjourned meeting of the rail manufacturers and railroad officials at a time to be fixed by the chairman of the meeting. There seems to be no doubt that the manufacturers and purchasers will reach a conclusion that is mutually satisfactory to them and which will be approved by the public."

Customs Decisions.

Zinc Plates for Calico Printing.

It was decided July 1 by the Board of United States General Appraisers that zinc plates containing patterns for calico printing do not fall within the meaning of "plates for printing," as that term is used in the tariff law. The protest before the tribunal stood in the name of J. A. & W. Bird & Co., Boston. The importers objected to the action of the customs authorities in exacting a 45 per cent. duty as manufactures of zinc. Instead, the claim for 25 per cent. under the printing plate paragraph was made. It was shown at the hearing that the plates are pressed against coppér rollers which take the impression of the pattern and from these copper rollers the printing of the cloth is done. The decision of the board states that the plates are not used for printing but as models or patterns from which copper rollers are made. The protest was accordingly overruled.

Scrap Tin Not Free.

The American Can Company and others have been defeated in litigation over the classification to be accorded scrap tin. The product was returned for duty as waste not specially provided for with duty at the rate of 10 per cent. ad valorem. It was claimed to be free of duty as scrap made from American tin returned. The further point was made by the importers that as scrap brass is admitted free, and as brass contains tin, scrap tin should also be admitted free. The board is unwilling to grant relief, as the decision says there has been no attempt to comply with the Treasury regulations affecting the return of American merchandise.

The United States Treasury surplus for the fiscal year ended June 30, 1907, is larger than that for any other year since 1890, except 1902 and years in which the war revenue laws were in force. The excess of Government receipts over expenditures in the year just closed as given by the Treasury Department was $86,945,542. In 1902 the surplus was a little more than $91,000,000 and in 1906 it was $25,669,322. The customs receipts broke all records, while the receipts from internal revenue were larger in the year just closed than in any other year when war taxes were not in force.

PERSONAL.

Guy C. Sibley, who for more than two years was editor of *The Tradesman* of Chattanooga, and for nearly four years a member of the editorial staff of the Knoxville *Sentinel*, has become editor of the Knoxville *American* of Knoxville, Tenn.

W. M. Carr and Charles H. Speer, have formed the firm of Carr & Speer, foundry and metallurgical engineers, 120 Liberty street, New York, as successors to Lane & Carr, H. M. Lane having disposed of his engineering interests to the new firm. Mr. Speer was formerly chief draftsman in the open hearth and rolling mill departments of Milliken Brothers, Incorporated, and previously was connected with the Lackawanna Steel Company in a similar capacity.

Carl V. Hammer, for the past five years purchasing agent of Williams, White & Co., Moline, Ill., has resigned to engage in business for himself, and has organized the Moline Mop & Wringer Company, of which he is manager.

Sir James Kitson of Leeds, a former president of the Iron and Steel Institute, has just been raised to the peerage. He is widely known in this country, which he has visited repeatedly.

J. M. Kemmerer, president, and W. A. Kemmerer, general manager, who organized the Kemmerer Iron & Steel Company, Scranton, Pa., and built its plant, which has been running for about six months, have severed their connection with that company. J. M. Kemmerer retains his connection with Bittenbender & Co., heavy hardware merchants, while W. A. Kemmerer is considering the position of sales manager with a large Eastern bar iron manufacturer.

John P. Quier, for many years assistant superintendent of the blast furnaces of the Bethlehem Steel Company, has resigned that position, taking charge July 1 of the blast furnaces of the New York State Steel Company at Buffalo, N. Y.

C. E. Sanders, for the past three years general purchasing agent for the Walter A. Wood Mowing & Reaping Machine Company, Hoosick Falls, N. Y., has resigned that position to assume the duties of permanent secretary of the National Plow Association, with offices in Rooms 417-419, Home Insurance Building, Chicago. Prior to his going to Hoosick Falls Mr. Sanders had for a long time been connected with the David Bradley Mfg. Company, Bradley, Ill.

Among those who have been appointed members of the Public Utilities Commission of the State of New York are Thomas M. Osborne of Auburn, a manufacturer of agricultural implements, and James E. Sague, mechanical engineer, a graduate of Stevens Institute, and until recently first vice-president in charge of manufacturing of the American Locomotive Works at Schenectady.

Fred E. Butcher, who has been manager of foreign sales of the Kilbourne & Jacobs Mfg. Company, Columbus, Ohio, has accepted the vice-presidency and general managership of the American Concentration Company, Joplin, Mo.

Charles A. Moore, president of Manning, Maxwell & Moore, Incorporated, New York, has returned from an extended tour through Europe.

George B. Dusinberre, manager of the Cleveland district office of the Westinghouse Electric & Mfg. Company, has resigned, and will open an office as consulting engineer in the Electric Building, Cleveland. He will make a specialty of electric power equipment for industrial plants and electric railroad work. Five years ago, when the British Westinghouse Works were started, he was a member of a committee sent to England to consider the standardization of apparatus that the company intended to manufacture and to give the plant the benefit of the experience of the American company. During the past few years he has done much consulting engineering work for the Westinghouse Company, and has been prominent in the development of the single phase system of electric railroad operation. He will be succeeded in Cleveland by G. E. Miller, at present assistant to the manager of the railroad and lighting department at the home office of the Westinghouse Company.

H. M. Beugler, formerly superintendent of railroads for Ford, Bacon & Davis, operating the Newman properties in Houston, Texas; Memphis, Little Rock, Birmingham, Nashville and Knoxville, has taken a position with the firm of Dodge & Day, engineers and constructors of Philadelphia and New York.

The Federal Railway Signal Company, 42 Broadway, New York, announces that P. G. Ten Eyck has been appointed vice-president, with office at Albany, N. Y. The revised list of officers is as follows: J. T. Cade, president; Lawrence Griffith and P. G. Ten Eyck, vice-presidents; Frederic Pruyn, treasurer; C. E. Newman, secretary.

The Lackawanna Steel Company, 2 Rector street, New York, announces that Arthur J. Singer has been appointed assistant to the president of the company, with special supervision of credits.

Harry S. Braman, formerly employed in the blast furnace department of the Ohio Works of the Carnegie Steel Company, has been appointed superintendent of the Alice Furnace of the Youngstown Sheet & Tube Company, at Sharpsville, and the Ella Furnace of Pickands, Mather & Co., at West Middlesex, Pa.

OBITUARY.

William P. Eagan.

William P. Eagan, late commissioner of the National Metal Trades Association, died at Pasadena, Cal., June 26, aged 34 years. Afflicted with pulmonary trouble he had gone to California in search of health. He was born in Cleveland, Ohio, where he worked for some years before going to Chicago. In October, 1899, he became manager of the credit department of the F. W. Wolf Company, Chicago, manufacturer of ice and refrigerating machinery, eventually becoming general manager of the company's operations. He was active in the organization of the Chicago Metal Trades Association, and for three years was on the Administrative Council of the National Metal Trades Association, of which, in 1904, he became commissioner, with headquarters at Cincinnati. A year ago he was forced to give up his work because of ill health, and his duties since that time have been looked after by Robert E. Wuest, the assistant commissioner. He was unmarried, and the remains were taken to Cleveland for interment.

WILLIAM P. EAGAN.

JOHN W. BAKER, a pioneer manufacturer of Akron, Ohio, and founder of the Baker-McMillen Company, man-

ufacturer of spirit levels, died June 24, as the result of injuries he sustained in a runaway accident two years ago. He was 80 years old.

HIRAM C. THOMPSON, president of the Thompson Clock Company, Bristol, Conn., died June 29, aged 76.

Trade Publications.

Electrical Apparatus.—Fort Wayne Electric Works, Incorporated, Fort Wayne, Ind. Bulletins, &c. Bulletin No. 1087 deals with standard direct current switchboard panels. These are made on the sectional unit plan, so that a variety of combinations are possible initially and later when changes become necessary. No. 1089, superseding No. 1064, pertains to standard alternating current switchboard panels for single phase circuits. No. 1090, superseding No. 1070, is devoted to the series arc lighting system for alternating current circuits with a frequency of 60 or 140 cycles, comprising the following apparatus: Constant current regulator, constant potential transformer, high tension switchboard, constant current A. C. arc lamps, and multiplex lightning arresters, which are fully described in this bulletin. Instruction book No. 3024 for the series A. C. arc systems gives information regarding the installation and the starting of the system, and general directions and data. A new bulletin index lists them by subjects and numbers.

Fans, Blowers and Exhausters.—Green Fuel Economizer Company, Matteawan, N. Y. Catalogue No. 104. Size, 6 x 9 in.; pages, 96. Describes and illustrates the company's line of fans, blowers and exhausters, giving dimensions for 290 sizes and types of steel plate fans for heating and ventilating, drying, mechanical draft, &c., for 27 sizes and types of planing mill exhausters for handling shavings, wool and other light materials, and also for a line of steam and hot water heating coils. Typical installations, containing some of the largest fans ever built, are described in detail. In addition there are over 20 pages of tables and data relating to air moving engineering. A table of capacities, speeds and horsepowers for steel plate fans is included.

Steam Specialties.—Chaplin-Fulton Mfg. Company, 28 Penn avenue, Pittsburgh, Pa. Catalogue. Size, 6 x 9 in.; pages, 50. Descriptive of a line of steam specialties, comprising the Vigilant feed water regulator, the Fulton pump governor, the Fulton steam reducing valve, the Fulton steam trap, the Bingham gauge cock, Rogers balanced packing for steam cylinders, and the Fulton ejector. Illustrations show the mechanism of these and their application.

Grates and Blowers.—McClave-Brooks Company, Scranton, Pa., Chas. N. Hays, general sales agent, Empire Building, Pittsburgh, Pa. Catalogue. Size, 6½ x 9 in.; pages, 52. Illustrates and describes McClave grates and Argand steam blowers, the two together forming a complete system for burning the cheaper grades of anthracite and bituminous coals, such as rice, birdseye, buckwheat, slack, screenings, duff, &c., while the grates alone are claimed to give excellent results in burning the larger sizes of either variety of coal by natural draft. The advantages claimed for the Argand steam blower are that it furnishes a large amount of air with a small amount of steam; that the air and steam are thoroughly mixed in the shell or case of the blower before the blast is delivered to the ash pit, and that it makes very little noise in operation.

Turret Head and Flue Cleaner.—Diamond Power Specialty Company, Detroit, Mich. Two pamphlets. One deals with the Diamond improved turret head, which can be used to advantage in any machine in which either the work or the tool rotates, and equally well in working wood, metals, marble and other material. The second concerns the Diamond flue blower, which is declared to be a quick and economical device for cleaning the flues of stationary and marine boilers.

Pump Regulating Devices.—Mason Regulator Company, Boston, Mass. Catalogue. Size 6 x 9 in.; pages 55. Pertains to the Mason automatic regulating devices for steam, electric and power pumps, including a steam pump speed governor, marine type steam pump speed governor, steam pump pressure regulator for hydraulic elevator service, by-pass or water relief valve, spring type steam pump pressure regulator, steam pump gravity tank regulator, steam vacuum pump regulator, steam driven blowing engine regulator, pressure controlling device, pilot valve, balanced valve and companion flanges.

Cold Drawn Metal Work.—John R. Keim Mills, Incorporated, Buffalo, N. Y. Leather bound reference book on cold drawn metal work. Vest pocket size, containing 68 pages, with additional blank pages for memoranda and notes. Shows some of the shapes the company is producing in a wide range of thicknesses of metal and sizes of finished articles. Much useful information in the way of tables of gauges, decimal equivalents, sizes and weights of flat rolled steel, weights of steel per foot, metric system measures of length, &c., is given.

Furnaces.—Monarch Engineering & Mfg. Company, Baltimore, Md. 1907-1908 foundry catalogue. Size 6 x 9¼ in.; pages 46. Illustrates and describes the Steele-Harvey crucible melting and refining furnace and miscellaneous furnaces in which fuel oil or gas and air are used. In the Steele-Harvey furnace a crucible is used, but it is not removed when pouring the metal. It is claimed that it is impracticable to melt bronze, red or yellow brass, borings and turnings otherwise than in a crucible and obtain a mixture that will pass physical and analytical tests. Monarchs high or low pressure fuel oil burners, ladle heaters in connection with fuel oil or gas and air, and rotary positive pressure blowers are also dealt with in the catalogue.

Machinery.—W. Gerhardi, Lüdenscheld, Westphalia, Germany. Catalogue. Size, 6½ x 9½ in.; pages, 53. Illustrates complete equipment for wire, rod, tube, sheet and rolling mills, including wire drawing, washing, straightening and cutting and spooling machines; automatic wire working machines; machines for tumbling and cleaning wire; complete outfit for galvanizing and tinning; wire hardening apparatus; circular shears for brass wire; draw benches for rods, shafts and seamless tubes; rolling machines for special work; swaging machines; and grinding machines, friction presses, eccentric power presses, and transmission of all kinds.

Oil Cups.—Automatic Oil Cup Company, 155 Huron street, Milwaukee, Wis. Circular. Pertains to Bangs' automatic oil cups, which can be placed in any position on eccentrics, crossheads, crankpins or any reciprocating bearing. Four sizes of feed accompany each cup from No. 1, the course feed, to No. 4, the fine. The oil is thrown to the top of the cup by the reciprocal motion, and is directed downward to the feed by radial curved guides. A small drop of oil is distributed at each stroke, and the greater the speed the more oil fed. A list of users and several testimonial letters are included.

Blast Furnace Construction.—William B. Pollock Company, Youngstown, Ohio. Supplment No. 7 to the company's general book, of views of blast furnaces which it has recently built. The photographs in this issue are of the Nos. 2 and 3, Haselton furnaces of the Republic Iron and Steel Company, Youngstown, Ohio.

Coal and Ash Handling Machinery.—Jeffrey Mfg. Company, Columbus, Ohio. Bulletins B and C. Give illustrations of installations of Jeffery machinery for handling coal and ashes in various plants, including brief descriptions of each department.

Springs.—Railway Steel-Spring Company, 71 Broadway, New York City. Catalogue. Size 6 x 9 in:; pages 34. Shows a few of the various types of springs made by this company for locomotives, passenger and freight cars, as well as for street cars and machinery. Among those illustrated are driving, truck, tender, caboose, reverse lever, duplicate tender, triplicate tender, doublet, quadruple and quintuple passenger, elliptic, three-quarter elliptic, single full elliptic, draft, freight bolster, equalizing, helical and safety valve springs.

Heaters, Separators, Coils and Bends.—Whitlock Coil Pipe Company, Hartford, Conn. Catalogue, 1907. Size 6½ x 9½ in.; pages 74. Treats in detail the company's line of coils, pipes, big bends, automobile coolers, hoods, &c.; plumbers' supplies; heaters, separators and exhaust heads, and is divided into sections. The first concerns coils and bends of iron, brass and copper pipe for heating, cooling, refrigerating, conduit and pneumatic service. Illustrations show spirals, conical coils, flat spirals and basket, kettle, flat rectangular, oblong and zigzag coils, and in connection with tables assist the customer in designating his wants. The same scheme is carried out in connection with the illustrations of the several types and kinds of bends and joints. The automobile section has many illustrations, with descriptive matter on coolers, hoods and exhaust, inlet and water pipes for automobiles. The heater section covers the American standard feed water heaters, reheater receivers, the American-Berryman feed water heater and purifier, American hot water heaters, American separators, open exhaust heaters and special heaters, all of which are fully described and illustrated, sections being shown in most instances. The American exhaust head is similarly presented.

Cranes and Hoists.—Northern Engineering Works, Detroit, Mich. Booklet No. 22. Devoted mainly to illustrations of electric traveling Northern crane installations, showing their application to various kinds of service. The booklet is issued with the reminder that the company's larger catalogue will be sent upon request.

Considerable trouble from interference with adjacent telephone lines has been given by the recently finished single-phase railroads in Indiana. In a number of cases a telephone company has found it necessary to remove wires which were parallel to a single-phase line. Experiments are under way to determine the cause of the interference.

At the shops of the Pennsylvania Railroad during 1906 there were built 235 locomotives, 149 passenger cars, 2124 freight cars and 76 maintenance of way equipment cars. Of the locomotives owned about 90 per cent. are kept in service while the remaining 10 per cent. undergo repairs in the shops.

NEWS OF THE WORKS.

Iron and Steel.

Another of the lap weld furnaces at the Youngstown department of the National Tube Company, Youngstown, Ohio, was started last week, and practically this entire plant is now in operation to full capacity.

It is stated that the Crum-Lynne Iron Works, at Crum-Lynne, Pa., will be sold at receiver's sale.

The Pennsylvania Steel Company will probably make extensive repairs to its No. 4 furnace at Steelton. No. 3 was overhauled and raised this year. The starting of the new open hearth furnaces at the plant has been generally successful.

After a successful run of a year the Pennsylvania Swedish Iron Company, Cheswick, Pa., has closed down its bloomary to make necessary repairs and give the tonnage men a much needed rest. During the year ending June 30, the company produced a little over 7000 tons of charcoal iron blooms from eight knobbling fires, which is thought to be a record tonnage from that number of fires. The material was used in making skelp for boiler tubes and sheets for various purposes.

The Independent Steel & Wire Company, House Building, Pittsburgh, Pa., has purchased the plant of the Acme Wire Company, Cuyahoga Falls, Ohio, which was offered at trustee sale, and it is probable that the plant will be enlarged. Arthur Hirsch will continue as manager of the plant.

General Machinery.

The recent fire in the boiler shop of the Thomas Carlin Sons Company, River avenue, Allegheny, Pa., was not of a serious nature, being confined to the building, the damage not exceeding $10,000, and the burned structure will be replaced at once. The fire will not interfere in any way with the filling of orders.

The Baltimore & Ohio Railroad has completed plans for the construction of several buildings, to be used in connection with the new terminal station at Washington, D. C., including a power house.

The Locomotive & Machine Company, Montreal, Canada, will shortly place contract for the building of a new erecting shop, for which very little new machinery will be required.

The Chamberlain Machine Works, Waterloo, Iowa, has been incorporated with an authorized capital of $20,000 to manufacture and sell gasoline engines and cream separators. Special attention will be given to the manufacture of metal repair parts for cream separators.

Plans for the construction of a factory and warehouse are now being prepared by the Wallace Machinery Company, Champaign, Ill., which was recently incorporated with a capital of $50,000. It is expected that work on the new plant will be begun on or before September 1.

The United States Corrugating Machine Company has been incorporated at Canton, Ohio, with a capital stock of $25,000. The incorporators are C. C. Barrick, H. C. Drum, W. W. Stephens, C. Weaver and Howard Pay.

The General Drop Forge Company, Buffalo, N. Y., is building a brick forge and blacksmith shop at Elmwood avenue and the New York Central Belt Line, to replace the building recently destroyed by fire.

The New York Concrete Wall Machine Company has been incorporated, with $50,000 capital stock, at Buffalo, N. Y., to manufacture patent machinery and tools for building with concrete. S. A. Williams is president and manager.

The Titusville Forge Company, Titusville, Pa., has placed its new blacksmith shop in operation. The equipment is modern throughout, and is especially adapted for marine and commercial work, either light or heavy.

Power Plant Equipment.

The Board of Public Service, Columbus, Ohio, will receive bids until July 10 for pumping machinery for the East Side sewage pumping station, including the erection of two units, each to consist of a horizontal centrifugal pump, chain driven by horizontal gas engine and having a maximum capacity of 2,900,000 gal. per day.

The Sweetwater Ice, Light & Water Company, Sweetwater, Texas, has been incorporated with a capital stock of $50,000. The officers are R. H. Fitzgerald, president; Thomas Trammell, vice-president; A. Q. Daniel, secretary and treasurer.

The Mallory-Maschke Company, 123 Liberty street, New York, has been incorporated to manufacture steam specialties, such as tube blowers, soot suckers, indicator reducing wheels, &c. S. W. Mallory is president and William O. Maschke secretary and treasurer. These officers with J. Higgs constitute the Board of Directors.

The Westinghouse Electric & Mfg. Company is building at its works at East Pittsburgh eight of the largest transformers ever built, each of them being of 1000 kw. capacity. They will be installed in the City of Mexico, where the local electric light and power company is making very extensive improvements. The City of Mexico obtains a very large part of its electric power from a waterfall 60 miles away, where electric current is generated at a pressure of 60,000 volts. When this high pressure current is transmitted through transformers it is reduced to 20,000 volts. Then it is again transmitted to five different substations surrounding the city, where the transformers now under construction by the Westinghouse Company will be installed. These transformers will reduce the voltage of the electric current to 3000 volts. This 3000-volt current will be used to operate a number of motor generator sets, from which a 600-volt current is taken to operate the motors on the street cars of the city or to furnish electric light.

A bond issue of $45,000 has been voted by Ashland, Ohio, for the enlargement of the municipal water works. It is the intention to install two new 125-hp. boilers and a new pump, having a daily capacity of 1,500,000 gal.

Motors and Small Engines.

The Essex & Smith Company has been incorporated at Buffalo, N. Y., with a capital stock of $25,000, to take over the business of the W. H. Smith Mfg. Company, and to manufacture the Essex patent hot air engines for light power purposes, operated with gas, gasoline, kerosene or alcohol as fuel. The company has equipped a factory at 6 and 8 Lock street.

Bridges and Buildings.

The Comptroller of New Orleans, La., will receive bids until July 15 for the erection of a new bridge of the Bascule or lift type, to span Bayou St. John.

The plant of the American Plate & Boiler Company, Columbus, Ohio, has been purchased by Oscar C. Hearing, William H. Renck, and William A. Painter, doing business as the Columbus Bridge & Iron Company. The plant is being remodeled and refitted into a structural steel plant, and the company, which has been securing structural steel work from other concerns, will hereafter do its own fabricating.

Bids will be received by the city authorities of Toledo, Ohio, July 10, for concrete approaches for the Cherry street bridge across the Maumee River in that city. Plans for a steel bascule lift bridge, which will be constructed under a separate contract, are being prepared by the Osborn Engineering Company, Cleveland, Ohio. The estimated cost of the approaches is $500,000, and of the lift $300,000.

The Variety Iron Works, York, Pa., formerly owned by the E. G. Smyser's Sons' Company, has been purchased by the Smyser-Royer Company, which has been recently incorporated. The plant, which was established in 1840, and since 1846 has been owned exclusively by E. G. Smyser, and since his death by his sons, is said to be the largest architectural iron foundry in Pennsylvania, and has enjoyed a wide reputation for its work. The new company intends to increase the output of the plant, and to do a more extended ornamental and architectural wrought and cast iron business. B. Frank Royer, vice-president of the William F. Remppis Company, Reading, Pa., and resident manager of the Philadelphia office, is president; William A. Myers, who has been general manager of the E. G. Smyser's Sons' Company for the past 30 years, vice-president and treasurer, and William H. Myers, formerly assistant manager of the Latrobe Foundry & Machine Company, secretary. The company will establish a Philadelphia office at 1506 Sansom street, which will be in charge of B. Frank Royer, president.

Foundries.

The S. Jarvis Adams Foundry Company, Fourteenth and Etna streets, Pittsburgh, manufacturer of brake shoes, pipe balls, axle boxes, &c., reports that its new plant at Midland, Pa., is nearing completion, and that arrangements are being made for removing the old plant and starting operations in the new one on or about August 1. The cupola will have a daily capacity of 200,000 to 250,000 lb. In addition to the above mentioned some other specialties will be manufactured, but they have not been decided upon as yet.

The Walton Foundry Company, Franklin, N. Y., is building an addition to its plant, 16 x 20 ft., which will be used principally for a blacksmith shop. The company will add to its equipment one new 14-in. lathe with 8 ft. bed, one drill press to drill to center of 34 in. circle, and one power hack saw.

The Gray Iron Foundry Company, Reading, Pa., has practically completed the additions to its foundry, mention of which was made some months ago. It has now been decided to add a brass foundry, for which an addition 30 x 56 ft. has been made. The electro-galvanizing department, having been found too small for the volume of business, is to be largely increased and a new department of electroplating is to be added. In the latter the jobbing trade will be particularly catered to, and every finish customary to the hardware trade will be made.

Fires.

The Wisconsin Wire Works, Appleton, Wis., was recently destroyed by fire, the loss amounting to about $22,000, on which insurance was carried to the extent of $18,000. This company was organized about six years ago, following a strike at the Appleton Wire Works plant, as a co-operative corporation, by union workmen. It has not yet been decided whether the plant will be rebuilt.

The plant of the Canton Brass Company, Canton, Ohio, was burned June 27, the loss being about $25,000.

The boiler works of the Willamette Iron & Steel Company, Portland, Ore., were badly damaged by fire June 23.

The foundry of the Christianburg Chilled Plow & Machine Company, Richmond, Va., was destroyed by fire June 27. The loss is placed at $15,000.

The calcining plant of the St. Joseph Company, Leadwood, Mo., was burned June 24.

The plant of the Utica Drop Forge & Tool Company, Utica, N. Y., was destroyed by fire June 25, the loss being over $100,000.

The Newark Meadows plant of the Consolidated Color & Chemical Company, was burned July 29. The loss is placed at $200,000.

The asbestos plant of the H. W. Johns-Manville Company, in Brooklyn, N. Y., was damaged $25,000 by fire June 29.

The factory of the E. A. Perkins Electrical Company, Torrington, Conn., was burned June 29, with a loss of $22,000.

Hardware.

The Moline Mop & Wringer Company, Moline, Ill., has been organized to manufacture and distribute the White mop and wringer in the States of Illinois and Iowa, for which it has secured the rights under patent. It is the purpose of the company ultimately to manufacture these goods, but for the present its attention will be devoted to their sale.

The Bushnell Tank & Fence Works, W. J. Vertrees, proprietor, Bushnell, Ill., has been incorporated under the name of the Bushnell Tank Works, with a capital stock of $75,000. The company manufactures wood and steel tanks, combination fence, lawn swings, &c. No change of ownership is involved in the reorganization.

The Terre Haute Malleable & Mfg. Company, Terre Haute, Ind., maker of the Safety tackle block wire stretcher and Hardware specialties, has found the factory, which was opened at the beginning of the year, inadequate in capacity to fill its increasing orders. Within a few days construction work will be begun on a new foundry building, 80 x 270 ft., which will include a 12-ton melting furnace.

The Champion Tool & Handle Company, Evart, Mich., manufacturer of the Champion lumbering tools, recently suffered a loss by fire, which destroyed the building containing the forging department, and injured much of the machinery. Steps will be taken at once to erect a large and modern factory building, which will be equipped with machinery suitable for the manufacture of logging tools. These improvements will be made with the least possible delay, and it is expected that the new plant will be ready for operation within three or four months. In the meantime a large part of the company's business is being taken care of at its branch factory, located at Cairo, Ill.

The Detroit Trust Company, as receiver, is advertising for sale at public auction on July 24, at the office of E. Bement's Sons, Lansing, Mich., the entire manufacturing property of E. Bement's Sons, including plant fully equipped for the manufacture of stoves, agricultural implements and bob sleds. The firm suffered financial losses in 1904, since which time the Detroit Trust Company has operated the plant as receiver. The property is a large one, composed of a plant centrally located in Lansing, fully equipped with modern machinery, and has employed 700 to 800 men. The annual product is about $1,000,000. A full line of stoves and agricultural implements is manufactured, and the firm is also a large producer of bob sleds and runner attachments.

The Colt's Patent Fire Arms Mfg. Company, Hartford, Conn., is running its works on an 11-hour basis, and is increasing its force as rapidly as competent help can be secured. The plant is being materially increased in size, considerably more of the Colt Armory buildings being taken over for manufacturing purposes, and new machinery is being installed as rapidly as it can be obtained.

The American Cheese Cutter Company has been organized at New London, Conn., with capital stock of $10,000. The incorporators are J. Lawrence Colt and Edith May Colt, Waterford, Conn., and William A. McElney, Meriden, Conn.

The Daisy Mfg. Company, Plymouth, Mich., is making an addition covering 10,000 sq. ft. of floor space to its already extensive plant. C. H. Bennett, the general manager of the company, has lately returned from a trip around the world, during which important connections were formed, and the Daisy air rifles are now meeting a demand in nearly every country of the globe. A stock of the goods is carried in Paris, London, Hamburg, Calcutta, Melbourne, Canton, and Shanghai, China, and Kobe, Japan, so that the company is in good position to fill orders promptly wherever they originate.

The Anchor Bolt & Nut Company has succeeded the Chapinville Wheel Company, Poughkeepsie, N. Y., manufacturer of carriage, machine and plow bolts, nuts and rivets. Albert J. Glass is president and John L. Glass, secretary-treasurer. The company states that it is making a line of extra good quality carriage and machine bolts, the business in which has been greatly extended, and is in a position to insure prompt deliveries on the smaller sizes of bolts.

The Livingston Mfg. Company, Rockland, Me., has purchased the business, machinery and good will of Nutting & Hayden, Concord, N. H., manufacturer of patent bush and scotia hammers. The entire contents of the Concord factory will be moved to Rockland, enabling the new owner to duplicate the firm's work in every way, both in the making of new hammers and in the fitting with new cuts of any hammer which the firm has ever made, if the number of the hammer and opening of the jaws are designated. The Livingston Mfg. Company has large works for the manufacture of granite cutters', paving cutters', quarrymen's, blacksmiths', and contractors' tools.

The directors of the Kinsley Iron & Machine Company, Canton, Mass., have voted to sell the plant, or, if this is not feasible, to liquidate the affairs of the company as quickly as possible in some other manner. The company manufactures bar iron, gray iron castings and the Kinsley wagon axle. The business is a very old one. It was established in 1787, and incorporated in 1854, and is owned by the estates of F. L. Ames and Frank M. Ames, having been in the Ames family for many years. Oakes Ames, the president, has very large financial and manufacturing interests, and the reason for the disposal of the business is his desire to concentrate his affairs. He is president of the Ames Shovel & Tool Company, which operates the principal shovel manufacturing plants of the country, and has recently taken the presidency of the Pneumatic Service Company. The plant produces annually about 7000 tons of bar iron, 400 tons of wagon axles, 1000 tons of gray iron castings, and sundry blacksmiths' tools, and employs about 250 men.

The Schatt & Morgan Cutlery Company, Titusville, Pa., has increased its capital stock to $100,000, fully paid. Additions to plant necessitated by increase in business and costing about $25,000 are about to be made. These include three brick buildings, one of two stories and basement, 35 x 100 ft.; another, one story, 20 x 100 ft.; and a third, one story, 20 x 90 ft. A fireproof vault for the keeping of dies, fine tools and manufactured stock will be provided. Electric power will be installed throughout the plant, old and new.

Miscellaneous.

The McCance Brothers Company, Pittsburgh, has recently installed more equipment in its plant in that city, which will double its capacity for handling galvanized materials and doing general galvanizing for the trade.

The Pittsburgh Elastic Enamel Company, Pittsburgh, advises us that the report that it would build a large plant at Clymer, Pa., the town having offered a site and a bonus of $25,000, is absolutely untrue. The company does not contemplate moving its plant from its present location.

The Lumen Bearing Company, Buffalo, N. Y., is erecting a new building, 30 x 125 ft., two stories, of fireproof construction, which will be connected by passageway with the main foundry. The building is to be used for the storage and manufacture of wood patterns and a carpenter shop.

The Falga Machine & Electric Company, Pittsburgh, Pa., has been organized to market a few patents owned by the incorporators. The present quarters in Pittsburgh are only to be used temporarily, and the company expects to move its office to Chicago before January. Vincent Ferk is president; J. F. Ambros, vice-president; John Granz, vice-president; Theodore W. Adlesic, secretary and treasurer, and F. Lamotke, manager.

The Engineering Works of Van Buren, Ark., has built and is equipping a new plant for the manufacture of mining, ore and industrial cars. Natural gas is supplied in sufficient quantity for all heating and power purposes. The plant is equipped throughout with modern machinery and appliances, and will have, when completed, an output capacity of 25 cars a day.

The Wisconsin Pressed Steel Company, Madison, Wis., recently organized with a capital of $50,000, contemplates the building and equipping of a plant in the near future. Plans, however, are not sufficiently matured for a detailed statement, but it is expected that their completion will not be long delayed.

The Kinsler-Bennett Company has been organized at Hartford, Conn., to manufacture automobile parts, special machinery and fixtures, and has located its works at 62 Market street. The company has already placed its orders for machine tools, and will use electric power.

The Art Metal Novelty Company, Hartford, Conn., has been organized and has established and equipped a factory at 308 Pearl street. The company will manufacture art metal novelties for the jewelry, stationery and department store trade, and will repair, lacquer and plate all kinds of metals, in all finishes. William B. Wright is president; Roger Otis Clapp, secretary and treasurer, and Edwood B. Gilbert, manager.

The Quad Stove Mfg. Company, Columbus, Ohio, has just moved into a new up to date plant. Its building is 50 x 150 ft., and two stories high.

The Coe Brass Mfg. Company, Torrington, Conn., one of the constituent parts of the American Brass Company, has purchased the plant of the Warrenton Woolen Company, with the purpose of securing room for the enlargement of its plant. It is understood that the woolen company will build a new and larger plant on some site yet to be selected.

The Iron and Metal Trades

While there will be some closing down of mills and Steel plants for repairs and betterments during July, it will be less than usual, owing to the great pressure for deliveries. In nearly every branch of the Finished trade it is the same story of a rush of specifications, and in some the mills have not made any headway at all to relieve the congestion. The operating departments are therefore driven to the utmost.

From all the principal distributing centers for Pig Iron comes the same story of a quiet market, and the extreme scarcity of spot Iron, notably of Foundry Pig, which characterized the situation some months ago, has disappeared. The result is that the premium for spot Iron is becoming very unusual. Still, Iron on old contracts is being taken right along and there is some demand for anticipating shipments, which indicates that the consumption continues on an unprecedented scale. It is doubtful, however, whether we shall continue to absorb much foreign Pig Iron. It is understood that a good deal of foreign Iron was imported under an arrangement with a large melter that the latter would take all that could not be sold in the market over a certain price, and this price, it is believed, has now been reached.

The Bethlehem Steel Company has accepted an order for 25,000 tons of Open Hearth Steel Rails for 1908 delivery from the Atchison, Topeka & Santa Fé Railroad. The specifications call for 25 per cent. top discard, for 0.04 phosphorus and 0.55 to 0.67 carbon, for which a special price is paid. There is practically closed an additional contract for 7000 tons, for a coal road, under the same specifications.

Specifications for Structural Material are coming in liberally, and the mills are well booked ahead. There are some good contracts in sight, among them being 12,000 tons for a power station in this city and 10,000 tons for the Chicago City Hall.

The Steel Bar trade is in a satisfactory condition. One Chicago interest booked 14,000 tons in one day last week.

Pittsburgh reports further business in the placing of orders for Steel Pipe lines, and the enormous pressure on the mills continues unabated. The Wire makers would like to accumulate some stock in anticipation of the fall demand, but have been unable to do so.

While the world's consuming markets are feeling considerable hesitation, growing out of the timidity of capital, and new projects seem to be moving slowly, yet there is a good volume of new business in certain quarters. This is notably true of India, and of China and Japan. From China have come orders for Bridge Material, including one lot of 1000 tons, with more to come. South Africa is a poor field, for well-known causes. Some orders have been placed for Structural Material for South America, including 2300 tons for the first sky-scraper in Buenos Ayres, a 10-story hotel.

The Copper deadlock has not yet been broken.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	July 3, 1907.	June 26, 1907.	June 5, 1907.	July 5, 1906.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$23.50*	$24.50	$25.50	$18.25
Foundry No. 2, Southern, Cincinnati	24.25	24.25	24.25	16.00
Foundry No. 2, Local, Chicago	*25.50*	26.00	26.50	18.00
Bessemer, Pittsburgh	*24.15*	24.15	24.40	18.35
Gray Forge, Pittsburgh	23.15	23.15	23.15	16.35
Lake Superior Charcoal, Chicago	*27.00*	27.50	27.50	19.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	30.00	29.50	30.00	27.00
Forging Billets, Pittsburgh	*33.00*	33.00	35.00	33.00
Open Hearth Billets, Phila	32.50	32.50	32.50	29.00
Wire Rods, Pittsburgh	*36.50*	36.50	37.00	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**18.75**	18.75	18.50	14.00
Steel Rails, Melting, Phila	*18.25*	19.00	20.00	16.00
Iron Rails, Chicago	24.50	24.50	24.50	21.25
Iron Rails, Philadelphia	*26.00*	27.50	27.50	20.00
Car Wheels, Chicago	*25.00*	25.00	25.50	18.00
Car Wheels, Philadelphia	*25.00*	25.00	25.50	16.75
Heavy Steel Scrap, Pittsburgh	*18.25*	18.25	18.50	15.50
Heavy Steel Scrap, Chicago	**16.50**	16.50	16.00	13.00
Heavy Steel Scrap, Philadelphia	*18.00*	18.25	19.00	15.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.83½	1.83½	1.83½	1.63½
Common Iron Bars, Chicago	1.78	1.78	1.78	1.66½
Common Iron Bars, Pittsburgh	*1.70*	1.70	1.75	1.50
Steel Bars, Tidewater, New York	1.86	1.86	1.84½	1.64½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York	1.86	1.86	1.84½	1.74½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.60
Beams, Tidewater, New York	1.86	1.86	1.84½	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.84½	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	**1.90**	1.90	1.85	1.57½
Skelp, Sheared Steel, Pittsburgh	1.90	1.90	1.90	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.40
Wire Nails, Pittsburgh	2.00	2.00	2.00	1.85
Cut Nails, Pittsburgh	2.05	2.05	2.05	1.75
Barb Wire, Galv., Pittsburgh	2.45	2.45	2.45	2.30
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*23.50*	23.50	24.25	18.50
Electrolytic Copper, New York	*22.00*	22.00	23.37½	18.37½
Spelter, New York	*6.35*	6.40	6.50	6.00
Spelter, St. Louis	*6.27½*	6.35	6.40	5.87½
Lead, New York	*5.25*	5.75	5.75	5.85
Lead, St. Louis	*5.15*	5.62½	5.65	5.80
Tin, New York	**42.75**	43.75	41.50	39.20
Antimony, Hallett, New York	*12.00*	12.00	17.00	23.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$4.09	$4.09	$4.09	$3.94

Chicago.

FISHER BUILDING, July 2, 1907.

It is not because of any activity, or the lack of it, that attention is centered upon the Pig Iron market, but rather to the turning of a crucial point that comes with the entry of a new delivery period. The softening tendency of spot Iron prices, previously noted, was expected to go still further under the stress of light demand at the opening of the third quarter. This result has been realized, and $21.50 heretofore asked for third quarter has become the price for spot or immediate delivery, with a strong intimation that $21 can be had for any part of this division, save Iron on track. One large interest has withdrawn all division prices, and is offering a flat price for the entire last half. The absence of buying, except for immediate needs, marks the determination of consumers to withhold purchases as long as possible, in the hope of forcing desired concessions. Indications are noted that point to a slight wavering of the firm attitude maintained by furnace interests, but the final result is yet in the balance. In Finished Material the greatest activity is shown in the demand for Steel Bars and Tubular Goods. In one day of the week just closed 14,000 tons of the former were booked by a single interest, which, together with additional tonnage taken, exceeds the total noted for the preceding week. In spite of the fact that the leading Tube interest is still months behind on deliveries, new business is being offered in such volume that practically no progress is being made in the clearance of accumulated tonnage. Business in Standard Section Rails has seemingly been halted by the adjustment, now in progress, of differences between

the mills and railroads respecting rolling specifications. Sales for the week were limited to one transaction of 2500 tons, booked by the Carnegie Steel Company. Business, on the whole, is quite satisfactory for the midsummer season, when some decline in volume is usually expected.

Pig Iron.—The opening of the third quarter finds business practically at a standstill, with a decided weakness in prices for spot Iron. As suggested in last week's report, the gap between spot and third quarter prices has closed up, and in coming together a basis slightly lower than that ruling for forward delivery has been established. The change has resulted in a decline of from 50c. to $1 a ton from the spot prices of last week's quotations. Aside from some carload trade in spot Iron there have been no transactions of any note. That some large consumers were buyers of small lots of transit and on-track Iron is attributed to delayed deliveries from Southern furnaces. Conditions in this respect are not altogether satisfactory and are said to be due to shortened furnace capacity resulting from various causes. As far as orders and inquiries for the forward delivery periods are concerned, the market is practically deserted. The determined refusal of buyers to accept the prices offered for future contracts is putting the stand-pat attitude of furnace interests to test, and the result will not long be withheld, for it seems certain that there is a considerable tonnage of third quarter requirements yet to be placed, and some large consumers are unprovided for a large part of fourth quarter needs. These must perforce soon come into the market, when some basis for price agreement will necessarily be reached. There are indications pointing to some further shading of third quarter prices, but there is no change in quotations on deliveries for the last quarter of this and the first quarter of next year, the former being $20 and the latter $18.50 for No. 2 Foundry, Birmingham. The following prices are for July, August and September delivery, f.o.b. Chicago, the spread indicated representing the difference between the earlier and later dates of this period:

Lake Superior Charcoal	$27.00 to $28.00
Northern Coke Foundry, No. 1	26.00 to 26.50
Northern Coke Foundry, No. 2	25.50 to 26.00
Northern Coke Foundry, No. 3	25.00 to 25.50
Northern Scotch, No. 1	26.00 to 26.50
Ohio Strong Softeners, No. 1	26.00 to 26.50
Ohio Strong Softeners, No. 2	25.50 to 26.00
Southern Coke, No. 1	26.35 to 26.85
Southern Coke, No. 2	25.85 to 26.35
Southern Coke, No. 3	25.35 to 25.85
Southern Coke, No. 4	24.85 to 25.35
Southern Coke, No. 1 Soft	26.35 to 26.85
Southern Coke, No. 2 Soft	25.85 to 26.35
Southern Gray Forge	24.35 to 24.85
Southern Mottled	24.35 to 24.85
Malleable Bessemer	26.00 to 26.50
Standard Bessemer	25.90 to 26.40
Jackson Co. and Kentucky Silvery, 6 %	31.40 to 31.90
Jackson Co. and Kentucky Silvery, 8 %	32.40 to 32.90
Jackson Co. and Kentucky Silvery, 10 %	33.40 to 33.90

Billets and Rods.—There is apparently more active inquiry for Forging Billets than for some time past, though resulting orders are few and generally of small tonnage. While the Eastern mills are evidently seeking business in this market more keenly than for some time, prices are well maintained, quotations ranging from $36 to $38. Rolling Billets are offered at $31, Pittsburgh. The scarcity in Wire Rods has not been measurably relieved, and the movement is in consequence light. Prices quoted are from $37 to $38, Pittsburgh.

Rails and Track Supplies.—Recent orders from lumber mill and coal mine interests have furnished a considerable tonnage in Light Rails, but the demand for Spikes and other Track Supplies is quiet. Pending the discussion of Rail specifications, now in progress between the mills and railroad interests, buying of Standard Sections has been practically suspended. Only one order, for 2500 tons, has been reported within the past two weeks, this being placed with the Carnegie Steel Company. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.90c. to 1.95c.; Spikes, 2.35c. to 2.45c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, $35; 25-lb., $36; 20-lb., $37; 16-lb., $38; 12-lb., $39, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Of the tonnage up for figures none of the deals involving large amounts have been closed since the last report. Among the smaller contracts, of which a good number were booked by the American Bridge Company, was one of 900 tons of bridge material for the Chicago & Northwestern. Plans now being prepared by Holabird & Roach, architects for the new Chicago City Hall, will call for around 10,000 tons, but this will not be ready for figures for some weeks. Specifications are being supplied in sufficient volume to fully engage mill capacities, and a good deal of new business is developing, though some contracts are very dilatory in coming to closure. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices, at Chicago, are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending, and other shop work.

Plates.—The leading Western mills are turning out a very heavy tonnage, on which specifications are plentiful. Business in forward bookings has decreased somewhat, and no new orders of exceptional tonnage are reported. During the period of midsummer, which ordinarily lessens the volume of business, it is expected that good progress will be made in the disposing of acumulated orders. We quote for future delivery as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in., up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.50c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—On Sheets the question still is, as it has been for some time, one of deliveries. The leading interest continues far short of normal service in shipments, but it is reported that, except on special grades and Galvanized, shipments are being made in 14 weeks, as against 24 weeks some time ago. Some of the smaller mills are in position to furnish both Black and Galvanized Sheets of sizes they roll in from four to six weeks. In addition to plentiful specifications there is still a large amount of new business coming in, though not equal in volume to that of the earlier months of the year. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 2.03c.; No. 12, 2.08c.; No. 14, 2.13c.; No. 16, 2.23c.; Box Annealed, Nos. 17 to 21, 2.53c.; Nos. 22 to 24, 2.58c.; Nos. 25 to 26, 2.63c.; No. 27, 2.68c.; No. 28, 2.78c.; No. 29, 2.88c.; No. 30, 2.98c.; Galvanized Sheets, Nos. 10 to 14, 2.83c.; Nos. 15 and 16, 3.03c.; Nos. 17 to 21, 3.18c.; Nos. 22 to 24, 3.33c.; Nos. 25 and 26, 3.53c.; No. 27, 3.73c.; No. 28, 3.93c.; No. 30, 4.43c. Sheets from store: Blue Annealed, No. 10, 2.50c.; No. 12, 2.55c.; No. 14, 2.60c.; No. 16, 2.70c.; Box Annealed, Nos. 18 to 21, 2.80c.; Nos. 22 to 24, 2.85c.; No. 26, 2.90c.; No. 27, 2.95c.; No. 28, 3.05c.; No. 30, 3.45c.; Galvanized from store: Nos. 10 to 20, 3.30c. to 3.35c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.85c. to 3.95c.; No. 28, 4.15c.; No. 30, 4.65c. to 4.70c.

Bars.—The strength of the demand for Steel Bars is surprisingly large and holds on with great tenacity. The sources which supply it are diversified and represent pretty nearly the whole line of industries using Bars. The business reported last week is duplicated, in that one interest reports the booking of 14,000 tons in one day. The implement makers are pouring in specifications against contracts in a way that augurs well for their faith in the crop outlook. There is no pressing demand for Iron Bars, though a fair lot of orders are being booked. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.78c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—While the demand for all sizes of Pipe is extremely heavy and shipments exceedingly slow, yet it is in the smaller sizes that the maximum is reached. Nothing short of four months is promised on 4-in. and smaller, and, indeed, it is difficult to name any reasonable delivery dates with absolute certainty. On top of orders booked, new business is constantly piling up, so that there is small encouragement for the expectation of better mill conditions at an early date. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to 1 point on the base. From store in small lots, Chicago jobbers quote 68 per cent. on Black Steel Pipe, ¾ to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—There seems to be no abatement in the demand for either Locomotive or Boiler Tubes. Here, as in Pipe, the difficulty is to supply the goods as needed. The stocks of large jobbing houses are the depot of supply for prompt requirements and, in the present state of deliveries, are about the only available sources for immediate wants. Mill quotations for future delivery on base sizes are as follows: 2¾ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft.; and 2½ in. and larger and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	"

Merchant Steel.—A seasonable demand, without special significance, as respects the movement of any of the various specialties grouped under this head, is noticed. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish, up to 1½ x ½ in., 1.93c.; Iron Finish, 1½ x ½ in. and larger, 1.78c., base; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots, and 45 per cent. in less than car lots, base territory.

Cast Iron Pipe.—Of the lettings including mentionable tonnage, those of the city of Cleveland, 1400 tons, and Medinah, Ohio, 500 tons, comprise the list this week reported. Bids on 2500 tons for the city of Columbus, Ohio, will be opened July 10. Business generally is quiet, and is mainly composed of small lot orders, the aggregate tonnage of which is moderate. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $38 to $39; 6 to 12 in., $37 to $38; 16-in. and up, $36 to $37, with $1 extra for Gas Pipe.

Coke.—No change is noted in the Coke situation, which, from the producers' viewpoint, is not at all satisfactory. For forward delivery 72-hr. Connellsville Coke is still quoted at $3.15 to $3.25, at ovens.

Old Material.—After the slide taken by Scrap prices last week, in which the values of practically all grades were affected, the downward movement was seemingly checked by the brisk buying that resulted. The decline was, however, only temporarily arrested, and still lower levels have been reached. There has been an active demand for Cast Scrap, which has supported prices against a further decline on No. 1 and Stove Plate. The softening of spot prices on Pig Iron, however, does not give promise of continued strength in this direction. Railroad Wrought is off a shade and Rolling Mill Stock is generally easier. The Chicago, Milwaukee & St. Paul is this week offering a list of 1340 tons, in which there are 400 tons of Rails and about 800 tons of Steel. Last week's offerings were quickly absorbed at top of the market prices. Prices are revised and the following quotations are per gross ton, f.o.b. Chicago:

Old Iron Rails	$24.50 to $25.00
Old Steel Rails, rerolling	18.25 to 18.75
Old Steel Rails, less than 3 ft	18.50 to 19.50
Relaying Rails, standard sections, subject to inspection	28.00 to 30.00
Old Car Wheels	25.00 to 25.50
Heavy Melting Steel Scrap	16.50 to 17.00
Frogs, Switches and Guards, cut apart	17.50 to 18.00
Mixed Steel	12.50 to 13.00

The following quotations are per net ton:

Iron Fish Plates	$18.50 to $19.50
Iron Car Axles	26.00 to 26.50
Steel Car Axles	21.00 to 21.50
No. 1 Railroad Wrought	15.50 to 16.00
No. 2 Railroad Wrought	14.75 to 15.25
Railway Springs	16.00 to 16.50
Locomotive Tires, smooth	17.50 to 18.00
No. 1 Dealers' Forge	13.25 to 13.75
Mixed Busheling	11.75 to 12.25
Iron Axle Turnings	11.75 to 12.25
Soft Steel Axle Turnings	11.75 to 12.25
Machine Shop Turnings	11.75 to 12.25
Cast Borings	10.00 to 10.50
Mixed Borings, &c	10.50 to 11.00
No. 1 Mill	10.00 to 10.50
No. 2 Mill	9.00 to 9.50
No. 1 Boilers, cut to Sheets and Rings	11.50 to 12.00
No. 1 Cast Scrap	19.00 to 19.50
Stove Plate and Light Cast Scrap	15.25 to 15.75
Railroad Malleable	17.00 to 17.50
Agricultural Malleable	15.50 to 16.00
Pipe and Flues	12.50 to 13.00

Metals.—Yielding to the determined attitude of consuming interests, which have persistently held aloof, refusing to buy at ruling prices, Copper has declined, and is now offered at 1c. under last week's quotations. Lead, Desilverized, and Antimony have shared in the receding movement, and prices are revised. Old Metals are also lower, prices having softened to the extent of from ½c. to ¾c. on Brass and Copper material. We quote as follows: Casting Copper, 23½c. to 24c.; Lake, 25c. to 25½c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 44c.; small lots, 44¾c.; Lead, Desilverized, 6.05c. to 6.15c., for 50-ton lots; Corroding, 7c. to 7.10c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 6.87½c.; Cookson's Antimony, 22½c., and other grades, 21c. to 21½c.; Sheet Zinc is $8.60 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 19½c.; Heavy Copper Wire, 19½c.; Copper Bottoms, 17c.; Copper Clips, 18c.; Red Brass, 17½c.; Red Brass Borings, 15c.; Yellow Brass, 14½c.; Yellow Brass Borings, 13c.; Light Brass, 11c.; Lead Pipe, 5¼c. Tea Lead, 4.90c.; Zinc, 5.15c.; Pewter, No. 1, 30c.; Tin Foil, 35c.; Block Tin Pipe, 40c.

The strike of the shipbuilders at the Globe yards of the American Shipbuilding Company, Cleveland, has been declared off and the men returned to work July 1, at the terms offered them by their employers.

Pittsburgh.

PARK BUILDING, July 3, 1907.—(*By Telegraph.*)

Pig Iron.—The market has been quiet, but there is more inquiry for Bessemer Iron, and some moderate sized sales are expected to be made shortly. A sale of 1500 tons was made for fourth quarter to a Pittsburgh consumer at $23, Valley furnace, or $23.90, Pittsburgh. On several inquiries for third quarter, $23.50 has been quoted, but possibly $23.25 could be done. We quote Bessemer, $23.25 to $23.50, Valley furnace, for third, and $23 for fourth quarter. The ascertained average selling price of Bessemer during June was $23.25, Valley furnace, or $24.15, Pittsburgh, sales of 46,000 tons being thus covered. Basic Pig is extremely quiet. The demand for it is fixed and not flexible, as in the case of Bessemer, so that some 10,000 tons from an Ohio Valley plant for July-September delivery thrown on the market through the Milliken failure, has not been sold, although offered at lower and lower prices. It is thought that $22, at furnace, would buy this Iron. The Pittsburgh Steel Company will have its new steel plant completed some time in the first half of next year, and will require at least 500 tons daily. A supply for it may be bought on a long term contract subject to an average price, but negotiations have not yet progressed far. Foundry Iron is very dull. Consumers are disturbed by lower prices now being quoted. For prompt shipment $25, Valley furnace, can easily be shaded. One fair sized lot is offered much below this. We quote for third quarter about $23, Valley furnace, and fourth quarter about $22.50. A sale of 150 tons of prompt Forge was made at $23.35, Pittsburgh. We quote later delivery, $22 Valley furnace. A sale of 500 tons of Low Phosphorus Iron for August to October delivery was made at about $28, delivered Pittsburgh.

Steel.—The market has been quiet since the large sales recently made by two interests. The two Youngstown producers are out of the market for this year. Bessemer Billets can be bought at $30, Pittsburgh, and this might be shaded on a very desirable order. We quote Open Hearth Billets $31 to $32, Pittsburgh, and Sheet Bars are very firm at $31, f.o.b. Pittsburgh.

(*By Mail.*)

The mills are closing for as short periods as possible for repairs. The Republic Iron & Steel Company has closed all its Iron mills, and they will be idle an average of two weeks. Its Steel plant will close the night of Wednesday, July 3, and will resume Sunday, July 21, at the latest. The Carnegie Steel Company is not closing any of its Steel plants. The National Tube Company has closed its McKeesport Works for a week or two, but is keeping its other plants in operation. The American Sheet & Tin Plate Company has closed its largest Tin mill, the Shenango, at New Castle, for about a month, to install automatic stokers, while it has closed the Sharon Tin mill for a couple of weeks for some necessary repairs, including the building of a new trestle for the coal cars. Most of its other Tin mills are being kept in operation, while somewhat less than half its Sheet mills are closed for a week, or for two weeks at the longest. The closing of a number of finishing mills, while nearly all the Steel works are kept in operation, should help to improve the supply of crude Steel, which is still inadequate, despite the heavier selling of the Cambria Steel Company and one or two interests which had not for some time figured in the market. An interesting development in this connection is that it is understood the Pittsburgh Steel Company has notified the Carnegie Steel Company of its desire to discontinue the Billet contract it has with it, on July 1, 1908, when three years of the period will have expired. This contract was made June 24, 1905, for five years, but with the privilege on the part of the buyer to cancel after three years had been completed, on appropriate notice. The Pittsburgh Steel Company is building an Open-Hearth Steel plant, as already announced. It will comprise eight 60-ton Basic Open Hearth furnaces, a blooming mill and three Billet mills. The Pittsburgh Steel Company will buy Basic Pig Iron in the open market, and may make a long-term contract for its requirements, about 500 tons a day, based on ruling prices at time of delivery. The Steel plant should be completed some time during the first six months of next year. At the time this Billet contract was made with the Carnegie Steel Company it was understood to be very favorable to the buyer, but on account of the great advance in Pig Iron it had become quite favorable to the seller. The finished material market is quiet, while in Pig Iron a much better tone is reported, although sales have been light. Ferromanganese has declined to the lowest price in a long while. Rails continue quiet, the local interest not reporting any sales as made last week. The outlook in Tin Plate is much improved, there being evidence that all consumers will take their maximum requirements.

Ferromanganese.—The market has been rather quiet for early delivery. For later delivery prices are distinctly easier, and it is stated on good authority that a sale of 1000 tons for the last three months of the year has just been made at $60, delivered, Pittsburgh. An equivalent price has been quoted for delivery at another point, same period, but lost the business. We quote Ferro for last quarter at $60

to $61, Pittsburgh, depending on tonnage, and at $62 to $63 for July and August.

Muck Bar.—There is little material to be had, but the demand is not heavy this week. We quote $37 to $38, delivered, Pittsburgh, for All Pig Muck Bar.

Skelp.—The market is firm but quiet, mills being well sold up. We quote for forward delivery: Grooved Steel Skelp, 1.90c. to 1.95c.; Sheared Steel Skelp, 1.90c. to 2c.; Grooved Iron Skelp, 2.20c. to 2.25c., and Sheared Iron Skelp, 2.30c. to 2.35c., these prices being f.o.b. maker's mill.

Rods.—The market continues strong. We quote Bessemer Rods at $36.50 to $37 and Basic Open Hearth at $37.50 to $38, both Pittsburgh.

Steel Rails.—The local Rail interest does not report any Rail sales as having been made last week. The Rail situation is very quiet, as the matter of specifications has not been threshed out yet. We quote Light Rails as follows: $33 to $34 for 20 to 45 lb.; $34 to $35 for 16-lb., and $35 to $36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at $28, at mill.

Plates.—No business of importance is reported this week, but there is the usual run of small orders, and the mills are comfortably fixed for some time to come. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in	.05
Plates over 110 to 115 in	.10
Plates over 115 to 120 in	.15
Plates over 120 to 125 in	.25
Plates over 125 to 130 in	.50
Plates over 130 in	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—Bids from general contractors on the First National Bank Building, Fifth avenue and Wood street, Pittsburgh, are to be received next Saturday. While this is essentially a one-story bank building, there are so many extras that about 1500 tons of Structural Steel are involved. There is an excellent run of small orders, but no large business just at present. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—Nearly half the Sheet mills are closed this week for repairs and on account of the Fourth, but the idle ones will be started as soon as possible. Shipments of Sheets during the first six months of this year have been the largest on record for a half year, although last year's tonnage was regarded as exceptionally good. Mill prices are firmly maintained, while premiums are frequently paid for early delivery. We quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 28 gauge Painted Roofing Sheets at $1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, $3.25 per square, for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Hoops and Bands.—The market continues strong, contracts being made at full prices. For prompt shipment buyers are still sometimes compelled to pay premiums of $1 to $2 a ton over regular prices for forward delivery, which are as follows: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Tin Plate.—The outlook has much improved in the past two or three weeks. While a month ago the prospects were that some consumers would take less than their expected requirements, the excellent growing weather of the past two or three weeks has altogether changed their views, and the prospects are that all the contract tonnage will be taken, while in some instances buyers are asking for heavier deliveries than they contracted for. Spot demand was light during June, while usually it is heavy, and this demand is expected to be spread over the next three months, assuring full operations until nearly the close of the year. The production of Tin Plate in the first six months of this year was well ahead of the record output made in the same period last year, and there is every prospect that the calendar year will break the record. We quote for third and fourth quarter delivery as follows: $3.90 for 100-lb. Cokes, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Bars.—A conference on the Bar Iron scale has just been arranged between the Amalgamated Association and the Republic Iron & Steel Company for next Tuesday, July 9, in Pittsburgh. If the scale is not settled by the following day, the 10th, the matter goes to conciliation. While no definite prediction can be made on such matters, it can be said that it is hardly likely the parties will want the scale to be settled in this way, so that a settlement may be reached on Tuesday or Wednesday of next week. Meanwhile, although the agreement permits of the mills being operated until August 10, when the conciliation would have to submit its finding, the Republic Iron & Steel Company has closed all its Iron mills for about two weeks for repairs. The demand for Iron Bars is quite good, and on ordinary lots mills have no difficulty in securing 1.75c., delivered, Pittsburgh, while on very favorable specifications 1.70c., Pittsburgh, would be done. Mills are booked well ahead on Steel Bars, but there is not a great deal of new business coming in. We quote Steel Bars for mill shipment at 1.60c., Pittsburgh.

Spelter.—The market has declined a trifle, but is fairly firm at 6.42½c., Pittsburgh. Transactions have been light and inquiry is not active.

Merchant Steel.—Some season contracts are still being made for Merchant Steel; otherwise the market is quiet. We quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The market is strong, but not very active. Producers are quoting $2.20 on large lots, but in one or two instances $2.15 can be done. Small sizes are quoted at $2.40 to $2.50.

Merchant Pipe.—Spang, Chalfant & Co. have just taken a contract for 10 miles of 16-in. Line Pipe for West Virginia and Pennsylvania fields, and are beginning shipments this week. The La Belle Iron Works have taken two good contracts, one from the Manufacturers' Light & Heat Company for 20 miles of 12-in. and another, from a private interest, for 10 miles of 10 and 12 in. The demand for Merchant Pipe continues excellent, mills being able to name almost their own prices where they can guarantee prompt shipment. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in	65	49
⅜ in	67	53
½ in	69	57
¾ to 6 in	73	63
7 to 12 in	70	55
Extra strong, plain ends:		
⅛ to ⅜ in	58	46
½ to 4 in	65	53
4½ to 8 in	61	49
Double extra strong, plain ends:		
½ to 8 in	54	43

All above discounts are subject to 1 point on the base and 5 per cent. on the net.

Official discounts on Iron Pipe, which are shaded one-half point or more to the large trade, are as follows, f.o.b. Pittsburgh:

Standard Genuine Iron Pipe.

	Black. %	Galv. %
¾ to 6 in	67	57
½ in	62	50
⅜ in	60	42
⅛ and ¼ in	58	42
7 to 12 in	62	47
Extra Heavy Iron Pipe, Plain Ends.		
⅛, ¼ and ⅜ in	62	40
½ to 4 in	59	47
4½ to 8 in	55	42

Iron and Steel Scrap.—The market is rather quiet. This is the season when a great many contracts are made between producers and dealers for the half year, but some of the dealers refuse to enter into negotiations, not being willing to make contracts based on the prices which have been ruling in the past few weeks. While the general situation appears good, it is noted that Scrap did not follow Pig Iron in its recent advance. Sales to consumers have been

light. Rerolling Rails are in good demand, bringing $19, f.o.b. Pittsburgh, or $20, delivered nearest consuming point. Prices are as follows: Heavy Steel Scrap, $18.25 to $18.50, for Pittsburgh, Steubenville and Sharon delivery, prices depending on quality; No. 1 Railroad Wrought Scrap, $18.50 to $18.75, and No. 2, $18 to $18.25; Bundled Sheet Scrap, $16.75; No. 1 Busheling Scrap, $18 to $18.25; No. 2 Busheling Scrap, $15 to $15.25; Old Steel Rails, short pieces, for Open Hearth purposes, $18.50 to $19; Old Steel Rails, rerollers, $20; Low Phosphorus Melting Stock, $22.50 to $23; Cast Iron Borings, $14 to $14.25; Stove Plate, $16.50 to $16.75; Old Car Wheels, $26 to $26.25; Steel Axles, $21.75 to $22; Grate Bars, $16.25 to $16.50; No. 1 Cast Scrap, $21 to $21.50; all above prices are per gross ton, f.o.b. Pittsburgh.

Boiler Tubes.—Some contracts for second half are being placed, but there is still a great deal of tonnage uncovered. Premiums are occasionally paid for prompt shipment. Official discounts are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Coke.—The Pickands-Magee Coke Company is making a shipment of 5000 tons of smelter Coke, to go on a vessel from Baltimore to Tampico, Mexico, and thence inland by rail. This is stated to be the largest shipment of Coke ever made on a single vessel. The market for Furnace Coke has shown a much stronger tone this week. Consumers are not satisfied that the improvement will be permanent, and the market is temporarily quiet. Standard Connellsville Furnace Coke is quoted at $2.40 to $2.60 for prompt or contract, while on Foundry Coke $3 to $3.25 is quoted. We note a contract in Foundry Coke for nine months, beginning now, at $3.15.

Philadelphia.

PHILADELPHIA, PA., July 2, 1907.

The history of the Iron trade for the first half of 1907 is now closed. That period has been one of the most remarkable which the trade has ever experienced. Prices of Pig Iron began at high figures, which have been maintained almost continuously until within the last four or five weeks. It may be noticed, however, that buying in the first quarter of the year for deliveries in the last half was at higher figures than are quoted at the present time, indicating that confidence at that time was stronger than it is at present. This may be due to less favorable conditions in regard to crops than was at that time expected, and also to greater uncertainty in regard to financial and political influences. Be that as it may, there was more eagerness to buy Pig Iron in January and February than at any time since then, and higher prices were paid than need be paid at the present time. There may be several reasons for this, but in all probability the difficulty which consumers of Pig Iron met with in regard to deliveries made them afraid that if orders were not placed a long way in advance they might perhaps be shut out entirely. Their expectations in this respect seemed to be fully warranted for a while, but at the present time purchases could be made for the last half at as low if not lower figures than were paid for the same deliveries during January. It is not yet certain, however, that they paid very much higher prices than will be realized during the remainder of the year, although with the present outlook the chances seem to favor the seller rather than the buyer to the extent of $1 or possibly $2 per ton. During the second month of the year there was a slight unsettlement in prices, but quotations were only fractionally lower, and that was because of the arrivals of large tonnages of foreign Iron, which at that time averaged about $23 on dock for No. 3 Middlesbrough, while No. 2 X (American) sold at from $26 to $27 for delivery during the first half of 1907. Toward the end of February the market weakened considerably, and prices were off about 50 cents to $1 a ton. During March and April prices began to firm up a little, and in some cases the highest prices since 1882 were realized. These two months were particularly disquieting to consumers of Pig Iron, as their deliveries were so far behind that genuine alarm was felt lest some of the works would have to shut down for want of material, so that when spot lots could be secured very extreme prices were paid, in some cases as high as $26 for Basic and $27.50 to $28 for No. 2 X Foundry. These, however, were what may be regarded as emergency transactions, and at no time represented the exact character of the market. The large consumption at that time as well as in prospect developed extreme nervousness, so that once in a while prices were paid which could only be regarded as cases of extreme necessity. The fifth month of the year developed a little less anxiety on the part of consumers, and prices began to ease off to more normal conditions. The sixth month developed a still greater unwillingness to pay the asking prices, and with better supplies of both foreign and domestic Iron everything in the nature of a premium seems to have dropped out of sight, and for the present the supply of Pig Iron appears to be in fair proportion to the requirements of consumers. As regards the last half of the year, there are no indications of any material shrinkage from to-day's prices. July will probably show a little weakening, because of the suspension of work at many of the mills and foundries, but the general situation appears to be sufficiently promising to prevent anything like a serious decline. The suspension of imports, which have averaged something like 50,000 tons a month, would steady the market considerably, and if the domestic supply is going to be large enough to meet the current demand, prices, if they go down at all, will go very gradually, so that no violent movement is expected for a long time to come. Nevertheless, the immediate tendency is undoubtedly toward lower figures, the decline in Foundry grades from the highest to the present time being about $2 per ton, and it is by no means certain that they can be held even at to-day's figures. The last half of 1907 will therefore be of intense interest to the entire trade, the balance at this time being so evenly poised that it will not take much to turn the scale down, nor to hold it on its present level. It may seem like useless repetition of the statement, but all the same the crops will be the deciding factor, and as they go trade will go; hence the market will probably mark time and go step by step with the crops until they are harvested and the results fully known.

Pig Iron.—The past week has been one of the dullest of the entire year. Buying has dropped off to almost nothing, and with that prices (of Foundry Irons particularly) have softened considerably. Premiums for early deliveries are practically nonexistent, and July deliveries can be had for about the same figures as for August or September. This, of course, would indicate that furnaces have reached a point at which they are not far from accumulations, but this is not complete evidence of the fact, although it has some significance. They are so fully sold up that they are obligated to make heavy deliveries, which absorb almost their entire output and to that extent give buyers pretty much all the Iron they need. Nevertheless spot Iron can be had without a premium, and it is that that gives significance to the entire situation. Whether it will result in a further shading down in prices in the near future remains to be seen. To-day's prices look low compared with those ruling three months ago, but they are $5 higher than they were on this date a year ago, so that in a relative sense they are still beyond the normal, and on general principles they should be adjusted in proportion to the declines which have been made in investment securities, which are largely based on their earning capacity. If construction work costs more than the average during a series of years, and the earning capacity of such completed work becomes smaller, new work will be curtailed until it can be done cheaper or prospects for its earning capacity become stronger. There is but little indication of the latter, so that the prices now ruling for Pig Iron appear to be extremely vulnerable, although, as we have already said, there is no reason for expecting anything but a gradual adjustment to whatever conditions may be developed during the remainder of the year. No. 2 X Foundry Iron is quiet and quotations for deliveries in buyers' yards, eastern Pennsylvania or adjoining territory, would be about $23.50 to $24 for July, August and September, and for the later months $22.75 to $23.25. Gray Forge would be about $22 to $22.50 for any delivery during 1907, short dates about $22.50. Basic is dull. Buyers do not want new Iron, and say that until shortages are made good they will not make bids for forward deliveries. Low Phosphorus buyers are in the market, but prices appear to be higher than large buyers will pay, although some business will have to be done soon, as contracts with large consumers are being rapidly completed. Prices are nominally $27.75 to $28, delivered, for small lots.

Ferroalloys.—There is little or no business doing, and prices are practically the same as last week, although no transactions have been made in this district. July shipments could be done at about $64, or covering the last half of the year at about $62.

Steel.—Business in this line holds up remarkably. The mills have taken some good contracts during the past few days and at full prices, showing that the demand is more than usually active. Prices are firm at the figures quoted last week—namely, $32.50 to $33 for nearby deliveries of ordinary Rolling Billets, and $36 to $38 for Forging Steel.

Plates.—There is quite a good demand for Plates, and the mills enter on the last half of the year under decidedly encouraging circumstances, considering the amount of new business that has been taken during the past two or three weeks. It may also be said that specifications are called for with unusual promptness. Prices are unchanged from last week's figures, which are as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Marine	2.20	2.25
Locomotive Firebox Steel	2.40	2.45

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	
Nos. 7 and 8, B. W. G.	$0.10
No. 9, B. W. G.	.15
Plates over 100 to 110 in.	.25
Plates over 110 to 115 in.	.65
Plates over 115 to 120 in.	.10
Plates over 120 to 125 in.	.15
Plates over 125 to 130 in.	.25
Plates over 130 in.	.50
	1.00

Structural Material.—Some improvement may be noted in the local demand, although it is not urgent nor for very large tonnages, but there is more business and in many cases the quantities taken are larger and prospects are considered to be somewhat better than they were three or four weeks ago. Quotations are continued at $1.85c. to 2c. for Beams, Angles and Channels, according to specification.

Bars.—There is a good demand for Bar Iron and some pretty large sales have been made within the past week or 10 days. Prices are steady at 1.85c. for Best Refined Iron and about the same for prompt Steel. Prices for the former leave very little margin to the manufacturer, but they anticipate lower prices for the raw material, which will help them a little.

Sheets.—The demand for Sheets is unusually well maintained, and the mills have all they can do to make deliveries as required. Prices are firm as last quoted for mill shipments, with the usual advance on small lots, as follows: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—The market is very weak and is practically dead as far as sales are concerned. Buyers are simply not to be found, as they are afraid to make bids until they are in greater need of material than they are at present. These conditions are likely to continue until it is felt that values are on a safe basis, which may be around to-day's quotations, or they may have to go still lower. Time alone can tell. Bids and offers for deliveries in buyers' yards are about as follows:

Steel Crops	$18.25 to $18.75
No. 1 Steel Scrap	18.00 to 18.50
Low Phosphorus	24.50 to 25.00
Old Steel Axles	20.50 to 21.00
Old Iron Axles	29.00 to 30.00
Old Iron Rails	26.00 to 26.50
Old Car Wheels	25.00
Choice No. 1 R. R. Wrought	19.50 to 20.00
No. 1 Yard Scrap	18.00 to 18.50
Long and Short	18.00
Machinery Scrap	20.00 to 20.50
Wrought Iron Pipe	16.50 to 16.75
No. 1 Forge Fire Scrap	16.50 to 17.00
No. 2 Light	11.00 to 11.50
Wrought Turnings	16.50 to 17.00
Stove Plate	17.00 to 17.50
Cast Borings	15.00 to 15.50
Grate Bars	16.00 to 16.50

Birmingham.

BIRMINGHAM, ALA., July 2, 1907.

Pig Iron.—"Quiet, but steady," was the expression used by one large local interest in speaking of the present situation. It is quiet in comparison with the remarkable activity which has prevailed for so long that the impression had begun to take root that this activity was a normal condition. Reports would seem to indicate that during the past week there was a slight awakening of interest, which chiefly found expression in numerous small orders for third and fourth quarter, from melters who had not fully covered for that period, and in much more numerous inquiries, feeling the pulse of the situation. While no sales of any consequence are reported, it is understood that the aggregate is somewhat greater than during any other of the past four weeks. Those melters who did not cover their requirements appear to be taking advantage of the slight relaxation in spot Iron to retrieve. The producers seem satisfied with the present and confident of the future, attributing the listless condition of the market to the usual summer let-up. It is generally understood that order books are comfortably filled for the balance of the year, some of the sellers having reserved no Iron at all to offer as spot Iron at a premium. The only recession in price has been on that class of Iron which seems to have assumed the price of third quarter deliveries. As much as $22 has been asked and received for immediate shipment, though $21.50 prevails where deliveries are as much as three weeks forward. Third quarter prices range from $21.50 to $22, with fourth quarter $20.50 to $21, and it is stated that no concession can be had from these prices. On all inquiries for the first quarter of 1908 $18.50 is steadily quoted, and it is stated that a few light sales continue to be made at that price. Charcoal Iron continues to hold its own in price, and the furnaces working on that class of Iron in this State report no falling off in orders. Charcoal Iron is firm, at $26.50 for the low grades and $27 for the chilling grades, f.o.b. furnaces.

Cast Iron Pipe.—The demand continues strong, and while no large business has been booked during the week small orders are numerous, and prices appear to be steady at 4 to 6 in., $36; 8 to 12 in., $34; over 12-in. average, $31 per net ton for Water Pipe, with $1 per ton extra for Gas Pipe.

Old Material.—The Scrap market continues quiet, though stocks are not increasing to any extent, and on all grades of Cast dealers are sold up far in advance. Dealers' quotations are about as follows per gross ton, f.o.b. cars:

Old Iron Rails	$22.00 to $22.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	17.50 to 18.00
Old Car Wheels	20.50 to 21.00
No. 1 R. R. Wrought	18.50 to 19.00
No. 2 R. R. Wrought	13.00 to 13.50
No. 1 Country Wrought	13.00 to 13.50
No. 2 Country Wrought	12.00 to 12.50
Wrought Pipes and Flues	13.50 to 14.00
Railroad Malleable	14.00 to 14.50
No. 1 Steel	15.00 to 15.50
No. 1 Machinery Cast	16.50 to 17.00
Stove Plate and Light Cast	13.00 to 13.50
Cast Borings	8.50 to 9.00

Cincinnati.

FIFTH AND MAIN STS., July 3, 1907.—(*By Telegraph.*)

Pig Iron.—No transactions of any importance occurred during the week. Outside of one or two inquiries for Malleable there is practically nothing being done excepting the usual run of small trade that is always expected. It is said that a few of the larger melters have been feeling the market, looking for a little prompt delivery Iron to cover them until later contract shipments are due, which would indicate that the general melt continues to be as heavy as ever. The present apathy is not regarded by the trade as of any special significance, but is simply the result of the heavy buying movement that has spasmodically made itself felt during the past year, and which in the nature of things could not possibly continue without an occasional interval of rest. Prices apparently have not been affected by this condition of affairs, and the ruling quotations as shown last week still obtain. It is reported that a number of the Southern furnaces show a much larger percentage of the lower grades in their yards than of straight Foundry grades, and with the continuance of present weather conditions it is but reasonable to expect that this tonnage will show a considerable increase. The demand for these lower grades, however, is said to be quite limited, and prices from time to time show a shade below the usual differential of 50 cents per ton. Very little new business into next year has been booked during the week, with prices for this delivery about $18.50, Birmingham, for No. 2. Freight rates from the Hanging Rock District to Cincinnati are $1.15, and from Birmingham $3.25. We quote for July delivery, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$24.75 to $25.25
Southern Coke, No. 2	24.25 to 24.75
Southern Coke, No. 3	23.75 to 24.25
Southern Coke, No. 4	22.75 to 23.25
Southern Coke, No. 1 Soft	24.75 to 25.25
Southern Coke, No. 2 Soft	24.25 to 24.75
Southern Coke, Gray Forge	21.75 to 22.25
Southern Coke, Mottled	20.75 to 21.25
Ohio Silvery, 8 per cent. Silicon	30.65 to 31.15
Lake Superior Coke, No. 1	24.65 to 25.15
Lake Superior Coke, No. 2	24.15 to 24.65
Lake Superior Coke, No. 3	23.65 to 24.15
Car Wheel Irons.	
Standard Southern Car Wheel	$29.00 to $29.50
Lake Superior Car Wheel	27.50 to 28.00

Coke.—Conditions are easy and contract business has slackened considerably. The supply is abundant and deliveries are excellent. Prices are unchanged. We quote best brands of Connellsville and Virginia Foundry from $3 to $3.25, f.o.b. ovens.

Finished Iron and Steel.—Specifications have been coming forward more slowly, which is perhaps satisfactory, as the mills are now working to the full limit. We quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.80c., with half extras; smaller lots from store 2c., with full extras. Steel Bars, carload lots, 1.75c., half extras; smaller lots from store, 1.95c., with full extras. Base Angles, carload lots, 1.85c. Beams and Channels, carload lots, 1.85c., base. Plates, ¼-in. and heavier, carload lots, 1.85c., base, and smaller lots from store, 2.25c. Sheets No. 16, carload lots, 2.05c., and smaller lots from store, 2.60c.; No. 14, carload lots, 1.95c., and smaller lots from store, 2.50c. Steel Tire, 1 x ¼ in. or heavier, 1.95c., in carload lots.

Old Material.—The market is less active, yet there is quite a large tonnage of Scrap moving all the time. Prices are being fairly well maintained. We quote dealers' prices, f.o.b. Cincinnati, about as follows:

No. 1 R. R. Wrought, net ton	$17.00 to $17.50
Cast Borings, net ton	9.50 to 10.00
Steel Turnings, net ton	12.50 to 13.00
No. 1 Cast Scrap, net ton	18.00 to 18.50
Old Iron Axles, net ton	26.00 to 26.50
Old Iron Rails, gross ton	24.50 to 25.50
Old Steel Rails, long, gross ton	18.00 to 18.50
Relaying Rails, 56 lb. and up, gross ton	28.25 to 29.25
Old Car Wheel, gross ton	24.50 to 25.00
Low Phosphorus Scrap, gross ton	20.00 to 20.50

Cleveland.

CLEVELAND, OHIO, July 2, 1907.

The movement of Ore from the upper lake ports continues heavy, and the situation at present is satisfactory to both the shippers and the vesselmen. While the figures showing the total June shipments are not yet available, all concerned believe that the shipments have passed the 6,000,000-ton mark and have broken the former high record of July, last year. The July movement, it is expected, will be as heavy as that of June. Some vesselmen have been more or less behind on their contracts, but they are now about all caught up. The contract tonnage is taking care of the most of the business, and there is not much demand for wild tonnage. Carrying charges on Ore hold steady and there is no indication of a change. The largest gains in Ore shipments during June were made at ports at the head of Lake Superior. Ore is coming in too fast for some of the furnaces, and because of lack of storage room at the furnaces they are having it piled on the docks. Complaints are still being made about the scarcity of cars, which causes some delay in the shipment from the docks to the furnaces. The Ore market is quiet, and prices are firm. There have been inquiries during the week for low Phosphorus Ore for Malleable Iron and one sale of 10,000 tons is noted. Ore prices are as follows at Lake Erie docks, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market remains quiet, although there has been a little more activity than during the previous week. The only sales noted are a few small lots of No. 2 Northern Foundry Iron for third quarter delivery at $24 and $24.50, at furnace. There is no demand for spot Iron, and the slight buying movement of Foundry Iron for the first quarter and the first half of 1908 delivery has subsided for the present. Foundrymen seem satisfied that Foundry Iron will not go higher for the first half of next year, and they are holding off to take advantage of lower prices in case the market weakens. In spite of a dull market prices remain firm and unchanged. Furnacemen appear satisfied with the situation and think that any weakness that may develop during a few weeks of dullness will quickly disappear when a buying movement for the first half begins. Some foundries will need considerably more Iron to fill out their requirements for the last half, but it is believed that they will have no trouble in buying what they need from furnaces that have not entirely sold out for the year. The majority of the foundries, however, have bought all the Iron they will need for the year, and there is an ocasional report of a foundry that has contracted for more Iron for the last half than it will want. The foundries, as a rule, are very busy, and are melting up their Iron about as fast as received. Few complaints are bieng made now that furnaces are behind on their delivery contracts. We quote Northern No. 2 Foundry Iron at $24 to $24.50 Valley furnace, for third quarter delivery; $23, at furnace, for the fourth quarter, and $21.50 to $22, at furnace, for the first quarter and first half of 1908 delivery. Basic Iron is quiet and no sales are reported. Quotations for the last quarter of 1907, f.o.b. Cleveland, are as follows:

Bessemer	$23.90
Northern Foundry, No. 1	$24.00 to 24.50
Northern Foundry, No. 2	23.50 to 24.00
Northern Foundry, No. 3	23.00 to 23.50
Southern Foundry, No. 2	24.35 to 24.85
Gray Forge	22.50

Coke.—No sales are reported either of Furnace or Foundry Coke. Foundries are pretty well covered for their requirements for the last half of the year. For last half delivery we quote Foundry Coke at $3.25 at oven. One interest is still asking $3.50.

Finished Iron and Steel.—Specifications on old contracts have come in very heavily during the week, consumers as a rule specifying to the full amount of their contracts. A large part of these contracts was made at a lower figure than the present prevailing prices, and consumers were careful to see that they specified for all the material they had coming to them on the old contracts before July 1, when the contracts expired. The specifications have been particularly heavy on Steel Bars. As a result of the heavy specifications, and because of the fact that many mills shut down July 1 for repairs and inventory deliveries, it is expected that the market will be tighter for the next few weeks. Taking the month as a whole, nearly all the mills report heavier specifications than during May. Little if any improvement is noted in deliveries except in Sheets, in which somewhat better deliveries in some sizes indicate an easing up of the situation. In the aggregate not a great amount of new business has been booked by the mills during the week, although the demand for Plates continues as strong as ever. One mill reports the sale of 4000 tons of Plates in a number of lots, and another mill has made sales at premium prices ranging from $2 to $4 a ton. No further contracts for Plates and Shapes for lake boats were reported. The larger Plate mills are well filled with orders for the balance of the year. For future delivery Plates are quoted at 1.80c., Cleveland. Some new Sheet contracts were closed for last half deliveries. Large consumers of Steel Bars had previously pretty well covered for the balance of the year, and little new business in Steel Bars is noted. Steel Bars for future delivery are quoted at 1.70c., Cleveland, for car lots. The Iron Bar situation is a little tighter as a result of heavy specifiations and the shutdown of the mills. We quote Iron Bars at 1.80c., Cleveland, for carload lots, with half extras, although on good contracts 1.75c., Cleveland, can be secured. Bar deliveries are not promised within three or four months. The demand for Structural Material is a little better than it was a few weeks ago. Although there are at present no single projects pending in this territory that will require a large amount of Structural Material, there is a good demand from Structural shops for material for small work and bridges, which in the aggregate will require considerable tonnage during the next few months. There is little demand for Billets at present, consumers in this territory evidently having covered for their requirements for the next few months. Warehouse business is considerably lighter than it was a few weeks ago. Stock prices remain unchanged. Steel Bars are selling at 1.95c. out of stock, and Iron Bars at 2c. Warehouse prices on Sheets are as follows: Blue Annealed No. 10, 2.30c.; No. 28 One Pass Cold Rolled, 3.05c.; No. 28 Galvanized, 4.05c. The stock price on Boiler Tubes, 2¾ to 5 in., is 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—There is still a good demand for Cast Scrap and the prices are firm, but otherwise the market is quiet. Rolling Mill and Steel works material is weaker as a result of the shutting down of mills for repairs, and the mills are holding off on shipments on contracts. Outside of Cast Scrap there is scarcely an inquiry for Old Material, and the present dullness is expected to continue through July, and still lower prices are looked for. The only railroad offering this week was a small tonnage by the Pennsylvania Company. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows, several quotations being lower than a week ago:

Old Steel Rails	$16.50 to $16.75
Old Iron Rails	24.00 to 25.00
Steel Car Axles	21.50 to 22.00
Old Car Wheels	23.00 to 23.50
Relaying Rails, 50 lb. and over	29.00 to 31.00
Relaying Rails, under 50 lb.	31.00 to 32.50
Heavy Melting Steel	16.00 to 16.50
Railroad Malleable	18.75 to 19.25
Agricultural Malleable	15.50
Light Bundled Sheet Scrap	14.50 to 15.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$26.00 to $27.00
Cast Borings	10.25 to 10.75
Iron and Steel Turnings and Drillings	12.50 to 13.00
No. 1 Busheling	14.00 to 14.50
No. 1 Railroad Wrought	16.00 to 16.50
No. 1 Cast	19.00 to 20.00
Stove Plate	15.00 to 15.50
Bundled Tin Scrap	15.00 to 16.00

So far as known, only one really fireproof building exists in this country. There are in the United States some 11,500,000 buildings valued at $14,500,000,000, or an average of $1260 each. In 1905, which was a normal year, new buildings to the value of $500,000,000 were erected, and $200,000,000 worth of old buildings (some of them not so very old) were burned up. Over $300,000,000 was paid for fighting fires, and $195,000,000 in fire insurance premiums, of which latter about one-half was paid back by the companies in adjusting losses. Hence it cost more to burn part of the old buildings and to keep the rest from burning than it did to put up all the new ones. The year 1906 was not a normal year. The big losses at San Francisco swelled the total to above $500,000,000, as the value of buildings burned. It has been estimated that the expenditure of $50,000,000 would have made most of the buildings burned in 1906 absolutely fireproof, and would have saved this tremendous physical and economic loss. But non-fireproof buildings are still being erected in enormous numbers in spite of this lesson.

A pumping engine of exceptional size has recently been ordered for the city of Nashville, Tenn. It will have a daily nominal capacity of 20,000,000 gal. of water, against a head of 390 ft., and will be operated by steam at a pressure of 160 lb. per square inch. The plunger speed is 240 ft. per minute at 20 revolutions of the engine, the stroke being 6 ft. The duty guaranteed is 175,000,000 foot-pounds per 1000 lb. of dry steam consumed by the engine and all its auxiliaries. The total horsepower required will be about 1550. The engine is being built by the Allis-Chalmers Company.

New York.

NEW YORK, July 3, 1907.

Pig Iron.—The market has been quiet, with only occasional buying of moderate amounts for nearby delivery. There is little pressure for spot Iron. We quote for spot Northern Iron, $24.50 to $25 for No. 1 Foundry, and $24 to $24.50 for No. 2 Foundry. For the third quarter we quote, for tidewater delivery, $24 to $25 for No. 1 Foundry, $23.25 to $23.50 for No. 2 Foundry, and $22.75 to $23 for No. 2 Plain. No. 2 Southern Iron is nominally quoted at $25.50 to $26 for spot and $25.25 to $25.50 for the third quarter.

Steel Rails.—The American Railway Association, consisting of the presidents and general managers of the leading railroads, has appointed a committee of nine to confer with a committee of nine representatives of the Steel companies on the subject of new specifications for Rails. Some important contracts for Steel Rails are practically closed. The report that the Atchison, Topeka & Santa Fé has purchased 30,000 tons of Steel Rails from the Bethlehem Steel Company is not officially confirmed.

Structural Material.—The American Bridge Company has definitely closed the contract for 7000 tons of bridge work for the Great Northern Railway Company for this year's delivery. The Northern Pacific is expected to close 14,000 tons in the near future. The New York Edison Company received bids yesterday on its power station at 201st street, which will require about 12,000 tons of Structural Material. J. G. White & Co. of this city still have about 2700 tons of bridge work unplaced for their Philippine railroad contract. The United States Steel Products Export Company, the foreign department of the United States Steel Corporation, has secured contracts for the material to build two large office buildings and a hotel in Buenos Ayres, totaling about 5000 tons. A great deal of business is still in prospect, and fabricators are of the opinion that the last half of the year will not by any means make a bad showing as compared with the six months just closed. It is possible that other parts of the country will show up considerably better in building contracts than this immediate vicinity. While competition among fabricators is sharp, there are some indications that shops which have been making lowest bids will hereafter endeavor to get better prices for their work. Costs are high, and margins have lately been uncomfortably small. The Structural mills are doing well in booking new business, which comes along in steady volume, while specifications on contracts have seldom been pressed so heavily for delivery as within recent weeks. We quote as follows for tidewater deliveries, mill shipments: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales are made out of stock of material cut to length at 2¼c. to 2½c.

Bars.—The demand for Bar Iron is comparatively light, with Best Refined quoted at 1.65c. to 1.70c., Pittsburgh, or 1.81c. to 1.86c., tidewater. Steel Bars are hard to get for anything like early delivery, leading mills not being able to promise the beginning of shipments on new orders under 90 days. Contracts for Steel Bars footed up to a large tonnage in June, the demand coming not only from heavy consumers, but also from merchants. Inquiries are now in hand for considerable quantities of Twisted Bars for concrete work. While some let-up in business is expected by the Steel Bar manufacturers in July and August, they are now so crowded with work that a slackening of the demand will be rather welcome. Quotations are maintained at 1.60c., Pittsburgh, or 1.76c., tidewater, for delivery beginning three to four months hence, and 1.86c. or higher for early delivery.

Plates.—The volume of local business has shown some improvement, as orders are rather more numerous, although as yet consumers are not showing much disposition to place contracts. Prices are firm. Quotations for tidewater delivery are as follows: Sheared Tank Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The Department of Water Supply of New York opens direct bids to-day for 5400 tons of Pipe, while bids on contract work involving the use of considerable additional quantities of Pipe will also be opened. It is expected that the prices submitted will give some indication as to the stability of the market. Some of the large manufacturers state that they do not propose to make bids for any part of this work, finding business with private parties more attractive. The general run of orders, although much lighter than usual at this season, is sufficient to keep the foundries from accumulating any stock. Some of them, however, are so filled with contracts for small sizes that they would in any event be unable to take business for early delivery. Prices on carload lots of 6 in. Pipe are quoted at $36 to $36.50 per net ton at tidewater.

Old Material.—Partly due to the hot weather and partly to the closing of consuming plants for mid-year repairs, the demand for Scrap has been light. The condition of the trade, however, is considered good for July. Dealers are looking forward with much confidence to a large demand in August, by which time more will be known as to the crops which are now giving promise of a better yield than was expected earlier in the season. Fair crops will make the mills busy and cause more Scrap to be consumed. Local stocks are not large. Quotations per gross ton, f.o.b. New York, are as follows:

Old Girder and T Rails for Melting	$15.75 to $16.25
Heavy Melting Steel Scrap	15.75 to 16.25
Old Steel Rails, rerolling lengths	18.75 to 19.50
Relaying Rails	27.50 to 28.00
Old Iron Rails	24.00 to 24.50
Standard Hammered Iron Car Axles	29.50 to 30.00
Old Steel Car Axles	20.00 to 20.50
No. 1 Railroad Wrought	19.00 to 19.50
Iron Track Scrap	17.00 to 17.50
No. 1 Yard Wrought, long	17.00 to 17.50
No. 1 Yard Wrought, short	16.50 to 17.00
Wrought Pipe	14.00 to 14.50
Light Iron	10.50 to 11.00
Cast Borings	12.00 to 12.50
Wrought Turnings	14.00 to 14.50
Old Car Wheels	23.00 to 23.50
No. 1 Heavy Cast, broken up	18.50 to 19.00
Stove Plate	16.00 to 16.50
Grate Bars	13.50 to 14.00
Malleable Cast	19.50 to 20.00

Metal Market.

NEW YORK, July 3, 1907.

Pig Tin.—Business during the week has been of diminished volume and prices have declined. The scarcity of spot metal, which has been a feature of the market for several weeks, has almost disappeared, and the spread of local prices between prompt and future deliveries has grown smaller. On June 27 the market was unsettled to a considerable degree. This was clearly shown by a sale of spot Tin in New York at 43.30c., and in Brooklyn at 42.80c. on that day. On June 28 prices weakened further, and Tin was sold as low as 42.62½c. Prices were slightly firmer on July 1, spot selling at 42.75c., while future deliveries were sold at 42.37½c. On July 2 sales of spot were made at 42.75c., and end of the week deliveries at 42.50c. Prices to-day may be quoted at 42.75c. to 43c. London closes strong to-day at £199 spot and £184 futures, with sales of 300 tons spot and 420 tons futures. The June statistics, compiled by C. Mayer, secretary of the New York Metal Exchange, show that deliveries into consumption were slightly smaller than anticipated, being 3050 tons. The total deliveries for the six months show a decrease of 1350 tons, compared with the same time last year. Stocks in this country are low, amounting to 992 tons, the bulk of which is held by a leading consuming interest, which has for some weeks been a seller of spot metal. Outside of the Tin held by this concern there is very little Tin to be had in New York. The total visible supplies at the end of June were 11,876 tons, a falling off of 139 tons since the end of the previous month, and 80 tons smaller than at the end of June last year. The arrivals since July 1 have been large, amounting to 1405 tons, and there are afloat for American ports 2573 tons, the bulk of which will probably arrive this month.

Copper.—There is a better feeling in the Copper trade, and although no actual transactions of magnitude are reported it is confidently believed that orders could not be placed at some of the low prices which have prevailed. Some business has been done in Europe and buyers there seem to be feeling the market, but there is considerable difference of opinion regarding the prices obtained. A comment frequently made is that one of the sellers of Copper, while continually making lower prices and naming concessions at which it has metal for sale, has little or no Copper to dispose of when actual buyers enter the market. Prices while nominal are relatively firm, and we raise the outside price as follows: Lake, 23.50c. to 24.25c.; Electrolytic, 22c. to 23c.; Casting Grades, 21.25c. to 22c. In the present temper of the market there is no unanimity of opinion regarding prices, one identified with the trade stating that if a large lot was offered, say 5,000,000 lb., at 15c., buyers would probably hesitate, hoping for lower figures. Consumers will not buy, and with a falling off in the demand for the finished product which has been noted they probably have sufficient metal on hand to keep their works running for a few weeks longer at least. The trade confidently expects and is anxiously waiting for the announcement of a large sale by some Lake producer, which will establish the market for the time being. The exports during June were considerably larger than those of the previous month, amounting in all to 16,195 tons. Exports for the first six months of this year amounted to 82,237 tons, or a falling off of 19,528 tons compared with those during the same period last year. The imports for the first five months of the year aggregate 56,250 tons, being an increase of 14,000 tons compared with the same period last year. This shows on the face an excess of nearly 5000 tons per month available for American consumption as compared with last year. The London market closed strong to-day at £99 15s. spot and £94 futures, with sales of 500 tons spot and 450 tons futures.

Pig Lead.—The American Smelting & Refining Company to-day reduced its price to 5.25c., New York. The action was not unexpected, having been foreshadowed for some time.

Spelter.—The dullness which has been noted for several weeks continues and prices are easy. Spot can be had in New York at 6.35c. to 6.40c., and in St. Louis at 6.27½c.

Ferroalloys.—Cancellations have been made in orders for some tonnage from European ports, but these are relatively unimportant. Sales of prompt deliveries of 50 per cent. Ferrosilicon have been made during the week at prices ranging from $105 to $108. It is reported that an electrical works will shortly start in this country, with a view to supplying part of the Ferrosilicon used here. Ferromanganese is likewise easy, future deliveries being sold at $63, Pittsburgh. There is little or no demand for prompt Ferromanganese, but dealers' prices are relatively firm at $65 to $67.

Aluminum.—Prices continue to be more or less nominal, and while progress is reported by the producers in the matter of filling orders consumers still complain of belated deliveries.

Nickel.—The price is unchanged at 45c. per lb. for ton lots, and 55c. to 65c. for smaller quantities.

Quicksilver.—Jobbing lots are lower, being quoted at $41 per flask, and in London Rothschilds' price is unchanged at £7.

Antimony.—The unsettled state that has been noticeable in this market for a long time continues. Hallett's is quoted at 12c., but sales have been made for future delivery at concessions from this price. Cookson's is relatively firm, because the supply is pretty well concentrated, 14.50c. being asked. Outside brands of Antimony can be had at almost any figure above 10.50c.

Tin Plates.—There is a fair demand from consumers, and the selling of Pig Tin by interests identified with the leading producer should not be taken as a sign that there is a falling off in the demand, as the Tin thus sold has probably been replaced. Prices are unchanged, at $3.90, f.o.b. Pittsburgh, and $4.09, f.o.b. New York, for 100 lb. IC Coke Plates.

Old Metals.—The reluctance of dealers to buy Copper Scrap of any description continues, owing to the stocks which are being accumulated on contract. Dealers' selling prices are therefore largely nominal, as follows:

	Cents.
Copper, Heavy Cut and Crucible	20.50 to 21.00
Copper, Heavy and Wire	19.50 to 20.00
Copper, Light and Bottoms	18.50 to 19.00
Brass, Heavy	14.00 to 14.25
Brass, Light	11.50 to 12.00
Heavy Machine Composition	18.25 to 18.75
Clean Brass Turnings	12.75 to 13.00
Composition Turnings	15.75 to 16.25
Lead, Heavy	5.12½ to 5.25
Tea, Lead	4.75 to 4.87½
Zinc Scrap	5.25

Iron and Industrial Stocks.

NEW YORK, July 3, 1907.

After a long period of listlessness, the stock market the past week developed decided strength, indicating renewed interest in speculative circles. This was partly due to the belief which had been becoming more pronounced of late that stock values had receded to a level that should be attractive to investors, and partly to the fact that the dividend and interest disbursements on July 1, which were known to approximate $200,000,000, would undoubtedly turn the attention of capitalists to the bargains offered in the stock market. The advances from Thursday of last week to Tuesday of the present week in active iron and industrial stocks were as follows: United States Steel common 34¼ to 37⅜, preferred 98½ to 100¼; Car & Foundry common 41¾ to 44¼; Locomotive common 57¼ to 59¼; Colorado Fuel 31½ to 33½; Pressed Steel common 35 to 36, preferred 87 to 90; Railway Spring common 41½ to 42¾; Republic common 26⅞ to 29½, preferred 82 to 83¼; Sloss-Sheffield common 57 to 58¾; Cast Iron Pipe common 34½ to 35¼; Can preferred 54 to 55½. The advance in the United States Steel stocks was perhaps the most significant of all the changes noted. Steel preferred rose above par for the first time in many weeks, while the great strength of the common stock lent color to the growing belief that a moderate increase in the dividend might be expected. The United States Steel Corporation is undoubtedly doing an enormous business, with net earnings running very close to what were deemed extraordinary figures a year ago. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 37¼, preferred 100¼; Car & Foundry common 44, preferred 99; Locomotive common 58¾, preferred 105; Steel Foundries 7, preferred 37; Colorado Fuel 33; Pressed Steel common 36, preferred 88; Railway Spring common 43; Republic common 28¾, preferred 83; Sloss-Sheffield common 57; Tennessee Coal 140¼; Cast Iron Pipe common 35¼, preferred 80; Can common 5¾, preferred 55.

The Pittsburgh Steel Company has arranged with the Union Trust Company, Pittsburgh, as trustee, for an issue of $4,000,000, first mortgage 6 per cent. bonds to provide funds for the erection at Monessen of eight 60-ton open hearth furnaces, a blooming mill and three billet mills. The bonds date from July 1 and will be retired in 1922. Of the new issue the amount necessary will be used to retire before December 1, 1907, outstanding bonds amounting to $568,000 authorized in 1901.

The Dominion Iron & Steel Company, Sydney, Nova Scotia, reports sufficient earnings in its fiscal year ended May 31, 1907, to cover the deficit carried from previous years and leave a credit to profit and loss of $318,711. This very gratifying result was attained after transferring to contingent account $810,713, to offset the amount charged the Dominion Coal Company for the excess cost of coal regarding which a lawsuit is pending. Options have been secured on several Nova Scotia coal properties which are now being prospected. The gross earnings from operation were $2,247,536, against $1,406,305 in the previous year, while interest payments were $684,384, against $694,532, leaving as net earnings $1,563,152, against $711,774. The excellent showing made the past year was, despite the fact that earnings from November to February fell off about $250,000, as compared with the average of preceding months of 1906, due to the breaking of the coal contract by the Dominion Coal Company. During the year $306,000 was spent on capital account, the chief item being the Bessemer plant.

Dividends.—The E. W. Bliss Company has declared a quarterly dividend of 2½ per cent. on the common and 2 per cent. on the preferred stock.

The Washburn Wire Company has declared a quarterly dividend of 1¾ per cent.

The Nova Scotia Steel Company has declared the regular quarterly dividend of 1½ per cent. on the common stock and 2 per cent. on the preferred stock, payable July 15.

The Vulcan Detinning Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable July 20.

The National Fireproofing Company has declared a quarterly dividend of 1 per cent., payable July 15.

The steam turbine, besides the driving of electric generators and steamships, has an important application in providing the power for blast furnace blowers. In one case the blower itself is similar in construction to the steam turbine by which it is driven, but its action is reversed, making it a compressor. Blowing engines of this type have been run at a speed of 3000 rev. per min., delivering 21,000 cu. ft. of free air per minute at pressures of from 5 to 15 lb. to the square inch. It has been shown that with the blast produced by these blowers a much greater output of iron can be obtained per horsepower expended, due to the fact that when the blast pressure falls below the normal and a corresponding increased quantity of air becomes necessary, the turbine is capable of providing the necessary extra blast with ease, while the reciprocating engine blower cannot greatly vary its output.

Reports from Sault Ste. Marie state that 6,343,645 tons of iron ore passed through the Soo canals during June, and that is approximately the tonnage of shipments for the month. The June shipments were, in round figures, 580,000 tons greater than those of July, 1906, the previous record breaking month.

The days of September 18 to 26, 1909, will be set apart for the celebration of the three hundredth anniversary of the discovery of the Hudson River by Henry Hudson, and of the one hundredth anniversary of the first practical application of steam to navigation by Robert Fulton, which was made on the Hudson. This decision was reached by the Hudson-Fulton Celebration Commission at a meeting June 26, in accordance with a report from the Committee on Scope and Plan. The commission has acted wisely in deciding not to celebrate these events by holding an international exposition, as was at one time seriously considered.

The scout cruiser Chester, named in honor of a Pennsylvania city, and one of the latest types of fast warships for the United States Navy, was launched successfully June 26, from the yard of the Bath Iron Works, Bath, Maine.

British Consuls in Canada.

A Recognition of Canada's Commercial Independence.

TORONTO, June 29, 1907.—Richard Grigg, a special commissioner of the department of the British Government known as the Board of Trade, has left Canada after an extended visit on official business. That business was the selecting of centers for the placing of local agents of the board, to be known as "correspondents." The duties of these correspondents are to be practically identical with those of British consuls. That they are not to be called consuls is due to the fact that they will belong to the imperial trade service of Great Britain, not to her foreign service. While their reports will be sent to the Board of Trade, they will possibly pass immediately through the department of the Government directly concerned with relations between the mother country and outlying parts of the empire, namely, the Colonial Office.

The decision to appoint these agents and maintain in Canada what is practically a branch of the consular service is more noteworthy than, superficially regarded, it may appear to be. It means the recognition of Canada's commercial independence. Virtually independent in trade matters Canada has been since the inauguration of responsible government. Since then she has been free to make a tariff to suit herself and without regard to the advantage of Great Britain. It is true she is not competent to enter into treaties, commercial or other, with foreign states, except with the sanction of the Imperial Government, but in recent years that sanction has never been withheld. The treaty negotiated in Canada's behalf with the United States in 1888 was not concurred in by the British plenipotentiaries until the Canadian Government was satisfied. It was rejected by the American Senate, largely because of terms inserted at Canada's instance. In 1897 the British Government denounced the commercial treaties with Belgium and Germany because Canada, who had been made a party to them in days when her will was not commonly consulted in such matters, demanded to be liberated from them. While Canada's autonomy in this regard has long been unreservedly acknowledged, the Imperial Government has kept on treating the trade of the Dominion as if it could be trusted to adhere involuntarily to the United Kingdom. The sentimental connection was relied upon to keep Canada's trade attached. Possibly sentiment on Britain's side had something to do with the leaving of Canadian trade to its own spontaneous action. The Imperial Government may have shrunk from appointing consuls here because of the feeling that such a formal act might be looked upon as a step toward separation, as a placing of the Dominion on the same footing as a foreign power. At all events, while every other commercial nation has ben increasing the number of its consuls in Canada, Britain has had no trade agents here at all, and it may in large measure be owing to that fact that her exports to Canada are not of greater magnitude than they are. Canada has commercial agents in the United Kingdom, but no resident representative of the Imperial Government is charged with the business of reporting about Canadian trade.

It is understood that nine correspondents of the British Board of Trade will be appointed in Canada. At what centers Mr. Grigg will recommend the board to station its agents is not known, but it is assumed that all will be prominent points of commerce and industry. The Montreal Board of Trade and the Council of the Toronto Board of Trade have passed resolutions strongly approving the proposal. They have added the suggestion that a man be sent out to act as chief of the service in Canada. It is considered essential to the success of the arrangement that such a general officer be put at the head of it, a man of tact and capacity, who knows what the British Board of Trade wants, and who can harmonize the local reports submitted to him before forwarding them. Without such a regulating Consul-General, it is not unlikely that the reports of local correspondents would become in some cases expressive of local pride that might be offensive to other centers.

A writer in the British weekly called *Canada*, deplores the backwardness of trade in Scotch iron and steel in this country, and says that the industrial relation of Scotland to Canada calls loudly for an organization of some kind. This organization, he insists, is needed to make known the requirements and possibilities of Canada to the manufacturers of Scotland. The consular service to be established may turn out to be the instrumentality desired. C. A. C. J.

The Detinning Litigation.

In a decision handed down July 2, reversing the lower court in the case of the Vulcan Detinning Company against the American Can Company, the Court of Errors and Appeals of New Jersey has carried the principle of the responsibility of an employee to keep inviolate the secrets of his employer one step further than it has ever gone before in the eyes of the law, making the responsibility involuntarily to extend to whoever hires away the possessors of the private knowledge.

The litigation just decided has extended over a number of years, and arose out of the use by the American Can Company of a process of separating and recovering tin and steel from tin cans and waste scrap which the Vulcan Detinning Company claimed to own.

The New Jersey court in its finding holds that the former employees of the Vulcan Company who received knowledge of the secret process in confidence became its trustees, with all the duties and obligations of such a position. By employing these men with the knowledge that they possessed the Vulcan Company's secret, the court contends that the American Can Company also became responsible and put itself in the peculiar position of trustee for its rival.

By this decision the American Can Company is not only permanently enjoined from proceeding with its detinning operations, but it is ordered to account to its rival for all of the profits it has made out of the detinning plants up to date.

Shipbuilding in the Fiscal Year 1906-7.

A greater number of vessels and vessels of immensely greater tonnage were built in the United States during the fiscal year ending June 30, 1907, than in any year for the past half century, and the gross tonnage of the vessels has been exceeded during only two years of American history.

During the year 1463 vessels of 510,865 gross tons were built in the United States and officially numbered by the Bureau of Navigation. Ship construction in 1855 aggregated 583,450 tons and in 1854 was only 536,046 tons. In those years the tonnage built in the United States greatly exceeded that of Great Britain. In the past fiscal year steel steam vessels built in the United States numbered 122 of 360,665 tons, by far the greatest tonnage of this description in the history of the country and about one-fifth of the tonnage built in the United Kingdom. Of these steel steamers 47 of 238,713 tons were built on the Great Lakes. Fifteen new lake steamers are each over 7000 tons. In 1903 the largest vessel built on the lakes was 5600 tons.

The total tonnage and average size of steel steamers built for the coasting trade also are the largest in history. On the seaboard 24 ocean steamers, each over 1000 gross tons, aggregating 98,028 tons, were built. Only two steamers were built for the foreign trade.

A press dispatch from Ottawa, Canada, states that the subsidy for the 25-knot steamship project, which, it is expected, will prove such a serious rival to the present New York route across the Atlantic, as suggested by Sir Wilfrid Laurier at the closing session of the Imperial Conference, is $250,000 a year for 10 years, to be borne equally by the British and Canadian governments.

The Machinery Trade.

NEW YORK, July 3, 1907.

Business with machinery houses the past week was rather quiet, though not more so than is generally expected around the first part of July. Some complaint is heard among a few dealers of a bad falling off in orders, but with the general trade no such condition exists. Most of the houses are receiving a fair volume of orders for small lots, but there has been a perceptible shrinkage in the number of inquiries received within the past eight or ten days, and very few of these have come from the larger buyers. No inquiries of importance from the railroads were reported. A prominent machinery merchant is of the opinion that the high rate for money and extended deliveries are responsible to a great extent for the slackening of demand for machine tools, and as soon as these conditions become better he looks for a more active demand from the larger interests. Deliveries are gradually easing up.

The announcement that the exposition, which was to have been held shortly at Vienna, Austria, has been postponed, will interest a number of American manufacturers of machine tools who have been asked by exporting houses to contribute exhibits. While the reason for the postponement or abandonment of the exposition has not been made public, it is thought probable that the apparent reluctance on the part of manufacturers to interest themselves in the scheme may have had some bearing in the matter. It is understood that the proposition to exhibit met with cool favor by many American manufacturers, most of whom gave the reason that they were too busy to make machines for show purposes, and exporting houses who were trying to get together a display of the machinery they sell were not sorry to hear of the postponement, as it was seen that the task of getting together a representative display would be a hard one.

The Machinery Club.

The Board of Governors of the Machinery Club has issued a circular to people in the trade who would make desirable members for that organization, explaining the purpose of the club and asking their co-operation. The circular states that quarters have been engaged on the twentieth and twenty-first floors of the Fulton Terminal Building on Church street, which will give the organization from 36,000 to 54,000 ft. of space, which will be ample for a dining room and grill room, library, smoking room, ladies' dining room, and perhaps a few bedrooms for the use of out of town members. The circular states that the organization will be primarily a luncheon club, but it is expected that the unusual superiority of the appointments and the convenient location will make it a rendezvous for the machinery trade in the city. President F. H. Stillman has appointed the following committees: Membership Committee—J. R. Vandyck, Vandyck-Churchill Company, chairman; Charles B. Crook, Lidgerwood Mfg. Company, and George L. Gillen, Watson-Stillman Company; House Committee—Thornton N. Motley, Thornton N. Motley & Co., chairman; E. H. Benners, Crown Castings Company; Charles A. Schieren, Charles A. Schieren & Co.; George A. Howell, Ingersoll-Rand Company, and P. A. Ware, *The Iron Age*.

The China & Japan Merchants' Association has been formed by New York firms engaged in the Chinese and Japanese trade, both as importers and exporters. It is the purpose of the association to further the interests of those engaged in that trade, and it is understood that the object of the organization is to look after American interests with the Oriental trade in a general way. Particularly, the organization will, it is understood, take up the question of transportation problems, especially as to the delivery of imported merchandise. F. H. Oulcott, 98 Front street, has been appointed secretary *pro tem* of the organization, and committees to form a constitution and by-laws have been appointed. Mr. Oulcott wishes to get in communication with those in all branches of the export trade whose interests the association will further.

Sirocco Engineering Company's New Plant.

The Sirocco Engineering Company, 138-140 Cedar street, New York, manufacturer of Sirocco centrifugal fans, blowers, exhaust pumps, dryers, conveyors, &c., has decided to locate its new plant at Green Island, Troy, N. Y., where buildings have been obtained which are exceptionally situated for both manufacturing and shipping purposes. The company's engineer is now preparing plans for overhauling and refitting the shops, work on which is expected to begin by August 1, with the intention of having the plant completely equipped and ready for operation by the close of the year. The determination to commence the equipment of the shops at once will undoubtedly mean that the company will come into the market very shortly for the mechanical equipment, part of which, we understand, has been arranged for. The plant has been secured on especially favorable terms, and the company has been fortunate in obtaining the co-operation of some of the largest financial interests in Troy. Shipping facilities are the best, the Delaware & Hudson Railroad tracks running through the site and tidewater being but 300 ft. from the buildings, while the New York Central & Hudson River and the Boston & Maine railroads are but 500 ft. away. The Sirocco blowers, originally made in Belfast, Ireland, and marketed quite largely in the United States for nearly four years, will be produced in the new plant, as soon as it is completed, for the entire Western hemisphere, Hawaii and Japan.

Practically a complete equipment for a modern boiler shop, including hydraulic, pneumatic and electrical tools, traveling cranes, &c., will be required by the Heine Safety Boiler Company, St. Louis, Mo., for equipping its proposed new plant. It will be several months, however, before the company will be in a position to know just what tools it will purchase. The new plant will be erected on a site of about 6½ acres, which has a frontage of 770 ft. on the Terminal Railroad, and which was recently purchased for about $14,000. It is the intention to spend about $300,000 on the erection and equipment of the new buildings.

The Sydney Foundry & Machine Works, Sydney, Cape Breton, is asking bids for complete equipment for its new foundry for making steel castings. A side blowing converter will be used. The equipment on which it is asking bids includes cupola, 15-ton electric crane, blowers, &c. The capactity of the converter required will be 250 tons per month. The company operates foundry, boiler, forge and machine shops, which are to be considerably enlarged by the erection of new buildings and the installation of modern machinery in order to take care of its increased business. In addition to the installation of the steel casting plant, the company has arranged for a department for the manufacture of bolts, rivets, spikes, &c. James Clark is president, and Wilfred E. Clark secretary and treasurer.

The Rockaway Rolling Mill, Rockaway, N. J., is purchasing some equipment to replace that destroyed by fire in its plant recently. The company has inquiries out for two small sized rolling mills and their accessories, together with some other equipment in that line.

It is understood that the Baltimore & Ohio Railroad has not as yet closed orders for the large list referred to in these columns several weeks ago. While the company has been doing a good quantity of machinery buying of late, the orders placed were from small lists of inquiries, some of which were sent out subsequent to the issuance of the company's large list of requirements.

In these columns two weeks ago mention was made of the orders placed by the Seaboard Air Line for the machine tool equipment for its new shops at Jacksonville, Fla. The list of machines, which covered 100 tools, including several large electric traveling cranes, was printed in our issue of May 16. The Niles-Bement-Pond Company secured the larger portion of the business, the company's order amounting to about $50,000.

The American Valve Company, Coxsackie, N. Y., has some inquiries out for equipment for a machine shop in course of construction there. The company is purchasing some turret lathes for the manufacture of valves and some motors for driving machine tools. The company's new machine shop will be 40 x 150 ft., and it is expected to have it in operation shortly.

The Hanson Van Winkle Company, 213 Market street, Newark, N. J., has in course of construction an addition to its plant at Chestnut and Van Buren streets. The structure will be used for the manufacture of electro plating machinery, and it will be 40 x 100 ft., and three stories high. The building will be of brick and iron construction, and the equipment for the plant is now being gathered.

New York Edison Company's New Central Station.

The trade will likely receive inquiries before very long for a large amount of machinery from the New York Edison Company for the equipment of its proposed new plant on 201st street, which will be of large proportions. While the dimensions of the building are not available, its size is indicated by the fact that 12,000 tons of structural steel will be used in the structure. While some contracts may have been placed for the larger machinery, it is understood in the trade that a good part of the equipment, such as cranes, coal and ash handling machinery, &c., has not been secured. In fact, the principal manufacturers' representatives in this city say that no inquiries for this latter machinery have as yet been sent out. It will be remembered that when the company built its waterside station it was almost continually in the market for a year or more for large quantities of various equipment, and as this station will be large it is probable that the company will be a good buyer for some time.

The Birmingham Railway, Light & Power Company, Birmingham, Ala., has authorized an issue of $25,000,000 of bonds, part to be used in retiring the outstanding bonds to the amount of $10,000,000, leaving $15,000,000 for im-

provements. The money will be spent at the rate of about $1,000,000 a year, in line with the plans the company inaugurated several years ago, and the largest immediate expenditure will be for the erection of a new power plant, which will probably be located near the coal fields, where fuel can be secured at a low price.

The chairman of the Board of Control, Winnipeg, Canada, will receive bids until September 3 for the construction of the general works and for the supply and erection of various portions of the equipment for the hydro-electric works and station at Point du Bois. Individual tenders will be received for a telephone system, general works, five 4000-hp. turbines, two 450-hp. turbines, five 3000-kw. generators, two 250-kw. generators, one induction motor, five step-up transformers, generating station, light, heat and power systems; generating station, oil and air systems; terminal station, light, heat and power systems; terminal station, oil and air systems; three electric traveling cranes, seven turbine governors, auxiliary apparatus, repair shops, &c.

The Corbett-Taylor Company, 143 North Warren street, Trenton, N. J., dealer in machinery and supplies, desires the agency for machines, boilers and engines of stationary type.

New England Machinery Market.

WORCESTER, MASS., July 2, 1907.

A marked betterment in deliveries of machine tools is reported by the dealers. Not all the manufacturers are making gains, but on the average machinery can be obtained considerably sooner than a few weeks ago. If this improvement continues, as expected, it should have a marked effect upon business, for there is plenty of demand for tools for early delivery. The machine tool builders, while they have found some falling off in orders, generally believe that it is due not so much to lack of need of new machinery on the part of customers and a desire on their part to buy, but to the fact that they do not wish to look too far into the future at this time in preparing for increased production. And, of course, the hot weather has a good deal to do with the slacking up. Many men do not want to talk business during the vacation season unless it is necessary, and are content with looking after the routine details of their establishments. The automobile plays its part in this respect, for a great many of the men who have the matter of equipment in hand are enthusiastic autoists, which fact causes them to leave their offices at the earliest possible moment. The general impression in New England is that when the cooler days of autumn arrive deliveries will have improved to an important extent on most classes of tools, and then buying will begin again in real earnest.

The dealers are not complaining of their June business. While the totals are not so large as those of the corresponding period last season, yet there was a good and profitable volume. The past week appears to have been an excellent one with them, a large number of orders having been booked for small lots and single machines.

The capture by the Fore River Shipbuilding Company, Quincy, Mass., of the contract for one of the new leviathan battleships is received with interest in the trade, as it is presumed that the builders will require some new equipment in connection with the fulfillment of the contract, and later on the list of machinery for the ship's repair shop should total a tidy figure.

The doubling of demurrage rates by the American Railway Association will affect New England more than most sections of the country. The practice in these States is to give the shipper four days to unload a car without penalty, while the usual custom in other parts of the country is to restrict him to two days. A very large per cent. of freight cars in New England is owned by foreign railroads, while the per cent. of New England cars on other lines is much smaller, so that the increase in penalty from 25 to 50 cents a day for all time that a car of one road is on the lines of another will aggregate a large item of expense for the New England railroads. They may change their rules, reducing the shipper's time from four to two days, in those States where the laws will permit. Connecticut has a special statute compelling the four days, and it is said that the railroads will put the matter up to the Interstate Commerce Commission to ascertain whether such a State law is valid as against the mandates of that body. It is feared that the result may be an increase in freight rates, to make up for the loss sustained by the railroads, if they can find no other remedy.

The consolidation of the Phœnix Iron Works Corporation and the Fenn Machine Company, Hartford, Conn., mentioned in *The Iron Age* of June 13, has been consummated by the organization of a new Connecticut corporation, known as the Taylor & Fenn Company. The plant of the Phœnix Iron Works will be enlarged immediately, and the machinery of the Fenn shop will be moved there as soon as the work of building is completed. The Taylor & Fenn Company has a capital stock of $100,000, of which $60,000 has been issued. Edward D. Redfield is the president; Charles L. Taylor, treasurer; J. H. K. Davis, secretary, and W. L. Fenn, works manager. The directors are Messrs. Redfield, Taylor and Davis, S. G. Dunham, George A. Fairfield and W. L. Goodwin. The Phœnix Iron Works plant consists of three buildings on Arch street, gangways running between them. Another story will be added to the buildings, forming a continuous floor, 40 x 200 ft. The erection of an entirely new building has already begun in the rear of the present works, which will be 30 x 125 ft., two stories. The new works will all be of brick and mill construction. These improvements will provide ample room for the several departments of the new company's business. The Phœnix Iron Works Corporation manufactures spring foot presses, disk grinders, textile machinery and gray iron castings. The Fenn Machine Company's line consisted of sensitive drills, automatic screw slotters and special metal working machinery. The mutual advantages of the combination will be economically important. The machinery of the two establishments will combine to make a most satisfactory equipment for the desired purposes. The Phœnix Iron Works were established under that name in 1834, and were succeeded by George S. Lincoln, who was followed by the firm of Lincoln & Co. The Phœnix Iron Works Corporation was organized in 1901, with Charles L. Taylor, treasurer of the new company, as manager. The business of the Fenn Machine Company was established about six years ago, with W. L. Fenn as its head.

The International Silver Company is to add a story to the brick portion of its factory at Wallingford, Conn., converting it into a three-story building. The new space will be 38 x 62 ft., and will be given over to the plating and finishing departments.

The Strong Mfg. Company, Winsted, Conn., manufacturer of undertakers' hardware, is replacing its old building, including an addition to its plant, 45 x 60 ft. and one story. The company states that it plans to replace its old equipment.

William M. Whitney, Winchendon, Mass., of Baxter D. Whitney & Son, manufacturers of woodworking machinery, has purchased the chair factory and water privilege of Wendell P. Clark & Co., at Centerville, in that town. Baxter D. Whitney & Son state that at present no statement can be made as to the disposition of the property, the matter not being entirely settled.

The Underwood Typewriter Company, Hartford, Conn., manufacturer of typewriters, is erecting an addition to its factory, 50 x 80 ft. and one story.

The Royal Typewriter Company, Brooklyn, N. Y., has decided upon some details of the new works which it is to erect at Hartford, Conn., as has already been stated in this column. There will be several buildings, one 50 x 307 ft. and four stories, another 50 x 130 ft. and four stories, and two one-story buildings, each about 50 x 130 ft. All will be of brick, mill construction.

The Confectioner's Machinery & Mfg. Company, Springfield, Mass., states that it does not propose to complete its plans for its new foundry at Brightwood, a suburb of the city, for some time to come. As was stated in this column last week, the general plan is to build a large, thoroughly equipped modern foundry, which will be, according to tentative plans, 90 x 243 ft. and one story, with the exception of a four-story section, 60 x 90 ft.

The New York, New Haven & Hartford Railroad lost the machine shop of its Central New England Division at Hartford, Conn., by a fire June 28, which also destroyed a roundhouse and a number of locomotives. The total loss was $85,000.

Philadelphia Machinery Market.

PHILADELPHIA, PA., July 2, 1907.

Inquiries for machine tools were somewhat better during the week just closed, although sales showed no material increase over those of the previous week. Generally speaking, the machinery market in this territory continues rather quiet, and in view of the usual midsummer holiday will probably remain so during the coming week. A number of plants will be temporarily closed for stocktaking, and the usual half yearly repairs, and in these cases buying will, no doubt, be held up for a short time. The total volume of business offered is not large. The demand for single tools has been somewhat inactive and has been confined mostly to the lighter class of tools. Inquiries for the heavier types of machine tools are particularly scarce at this time, although the demand for the heavier special tools keeps up fairly well. There are several inquiries before the trade for small lots of tools from nearby concerns, but the bulk of the present day business is made up of single tools. There is practically no buying on the part of the local railroads, and

from present indications little except scattered orders are expected during the summer. There is a possibility, however, of some railroad business developing from some of the Southern and other railroads.

Figures for the half year's business, or for that done by the various concerns during the month of June, have not yet been completed, and it is therefore impossible as yet to give any accurate idea as to the comparison of the business transacted during the past six months. In some cases it is said that the volume of business done is pretty fully up to that of the previous half year. In others it has been exceeded, while in a few instances a falling off in the volume of new business will no doubt be noted.

Manufacturers keep as busy as ever, sufficient business being on order books in almost every case to keep plants fully occupied well over the summer months, and in some instances during the remainder of the year. New business, however, has been falling off some of late, and deliveries on certain classes of tools have improved considerably. Manufacturers, as a rule, have no objection to the present dropping off in new business, as the strain of taking care of the enormous volume of business has been heavy. Every department has been keyed up to the highest pitch, and some little recession in business would enable manufacturers to operate their plants on a more satisfactory basis than has been the case generally for some time past.

There has not been much change in the foreign demand. Some scattered inquiries for special tools are to be noted, but nothing of any size has been received from the foreign trade. One inquiry for a medium sized lot of tools for Cuba has been pretty generally distributed through the local trade recently, but outside of this nothing of particular interest has developed.

The demand for boilers and engines continues fairly active, the greater proportion of the business closing at the present time being for those of the medium and larger capacities. Some good business is before the trade, but in view of general conditions some of these propositions are rather slow in closing up. The demand for second-hand boilers and engines, while fairly good, is not as active as the trade would like to see.

Second-hand machine tools are not in as good demand as some time ago. The general inactivity of the trade during the summer months affects this as well as other branches of the trade.

The demand for iron and steel castings continues fairly active. The slackening demand for machine tools will no doubt be felt by some foundries, but as there is now considerable work ahead it may be some time before any appreciable falling off will be noted in the foundries. Steel casting plants continue the more active, although some of the gray iron foundries also have more work offered than they can well take care of.

The Earle Gear & Machine Company, now located at Hancock and Oxford streets, has had plans prepared and will erect a new shop at Stenton avenue and Louden street. The new plant will be 79 x 179 ft., two stories. It is understood that quite a good quantity of additional machine tools and equipment will be needed for the new plant.

The Spanish-American Iron Company, Girard Building, is receiving bids for a quantity of machinery and tools for the equipment of a repair shop in Cuba. It is said that the equipment will aggregate an expenditure of between $8000 and $10,000.

The machine shop of P. H. & A. S. Morris, Front and Dickinson streets, was practically destroyed by fire June 26. The building and machinery were fully insured and rebuilding will be started as soon as the insurance is adjusted. Considerable new machinery will be required to replace that destroyed.

A. H. Knott and R. K. Inskeep are having plans prepared for the erection of an automobile garage at 2801-05 West Susquehanna avenue. The building will be 44 x 55 ft. Repair work will be an important feature.

The Norbum Engineering Company, 1134 Real Estate Trust Building, which was recently formed to engage in the business of consulting and contracting engineering, has completed arrangements to represent the Great Lakes Engineering Works, Detroit, Mich., in the Eastern States. It will also represent the Hill Clutch Company, Cleveland, Ohio, in Philadelphia and surrounding territory, as well as engage in the designing and building of power transmission machinery, gas engines, and producers, gears and special machinery of various descriptions.

The Hub Machine & Tool Company has recently added facilities to its plant so as to enable it to increase largely the production as well as to decrease the cost of manufacture. In connection with this it announces a reduction of 15 per cent. in the selling price of its No. 2 Acme saw table. This machine has been on the market for about six months and is said to be giving very satisfactory results. This sized machine is built particularly heavy, takes in saws up to 10 in. in diameter, and occupies a floor space of 24 x 30 in.

Chicago Machinery Market.

CHICAGO, ILL., July 2, 1907.

Reports from the various machine tool interests, while lacking in uniformity as to the volume of business transacted, seem on the whole to indicate a generally quieter movement. Some good sales have been made, comprising quick delivery shipments of tools from stock, of which second-hand tools form a considerable part. But even for single tools and small lot orders, which for some time have lent strong support to the market, the demand is sensibly diminished. On account of the many influences that may be assumed to have a retarding effect on trade, it is difficult to assign any one cause as directly responsible for the effects noticed. Dealers say that buyers who have been making inquiries are advised that but little improvement in delivery can yet be promised and decline to place orders. Their needs are for work in hand, which, even with present facilities, they will in many cases be able to dispatch before the new tools would arrive. There is, under the circumstances, small incentive to buy in anticipation of future demand. Forward orders for new equipment are in consequence not now nearly so plentiful. On the other hand, the future plans of some large interests give promise of the early issuance of lists of notable importance. It is also a hopeful sign that of the number of large prospective requirements figured on earlier in the season, none has been reported as definitely withdrawn on account of final abandonment of plans. It is believed that the effect of reduction in volume of new business will soon be reflected in a general betterment of deliveries from the factories. Railroad buying is limited to the few orders for specific requirements that are always more or less in evidence in the market. Among the orders of this character received were several calling for shears and punches for boiler shop equipment.

Of forward railroad requirements in tools and machinery a list from the Frisco system is in anticipation. Bids were made on a large amount of machinery for this interest last fall, but it is understood that not nearly all of the list then issued was purchased. Plans are now being made for new shops at Springfield, Mo., for the construction of which about 3000 tons of structural steel will be used. The Arnold Company, Chicago, which is the engineer and contractor for this work, will have charge of the machinery installation, including tools and electrical equipment. Lists covering these requirements have not yet been prepared, and it will probably be some time before inquiries for this equipment reaches the trade.

It has finally been decided to replace the old Chicago City Hall building with a new one, duplicating in its exterior the new County Court House, which it adjoins. Demolition of the old structure will begin about September 1. Holbaird & Roch, who designed the county building, have been selected as architects. The machinery equipment of the new building will include boilers, elevators and possibly an electric generative plant, though the taking current for lighting and power purposes from outside sources is being considered.

The consolidation of the Columbus Light & Power Company and the Columbus Street Railway Company is announced. These interests have been merged into the Columbus Railway Light & Power Company, Columbus, Miss., with a capital of $300,000. It is the purpose of the new organization to extend the lines and generally improve the railway properties and power plant equipment.

The Warner Gear Company, Muncie, Ind., manufacturer of differential and transmission gears and steering apparatus, has broken ground for a new factory building, 140 x 150 ft., of brick and concrete construction, with a saw tooth roof. The building will have two stories, and when fully equipped will double the output capacity of the present plant. Metal sash, metal skylights with suitable opening devices, and fireproof doors are to be included in the construction.

The Board of Public Works of Aurora, Ill., has been authorized by the City Council to secure plans, specifications and advertise for bids on an air compressor of 2000-ft. capacity, which it is proposed to install in the pumping station.

Among the important shipments of machine tools recently made by Hill, Clarke & Co. was one of two carloads for the Cananea Consolidated Copper Company, Cananea, Sonora, Mexico. Included in this shipment were one 56-in. planer, one 5-ft. Western plain radial drill, one 30-in. Whitcomb Blaisdell engine lathe and an 18-in. Flather engine lathe.

Contracts have been let by the Nicholson File Company for the construction of new buildings at its Arcade Works, Anderson, Ind., which involve an expenditure of over $30,000. These structures, which replace some old buildings put up during the gas boom, will furnish about 10,000 ft. more of floor space. A bituminous scrubbed gas producer, purchased from the Industrial Gas Company, New York, will be installed to furnish fuel for small annealing forges.

Cleveland Machinery Market.

CLEVELAND, OHIO, July 2, 1907.

The machine tool market continues satisfactory for this season of the year. During the week local dealers have booked a fair volume of business. The entire demand for tools has come from the automobile manufacturers, a number of whom have, during the past few days, placed orders for lathes and other tools for additional shop equipment. Taken altogether, the June business of the local machine tool dealers was about as good as that of May. Dealers, however, do not expect that the activity of the past week will keep up, and they are looking for the usual quiet spell during July and August. The automobile manufacturers in this city and vicinity have been holding off from making purchases of machine tools for increasing their output of machines for 1908, until they know more definitely the outcome of this year's business. While sales of this year's machines were not as heavy as anticipated early in the season, due largely to the late spring, orders have come in in a very satisfactory shape during the past few weeks, and nearly all the local manufacturers report that their season's output is now pretty well sold, and some of them have scarcely a car left. All manufacturers continue very busy, and some plants are working overtime to keep up on orders. While some report that orders are not coming in as plentiful as they were, others notice no decrease in the demand, and all have enough orders on hand at present to keep their plants busy through the summer. Foundrymen in this city report no falling off in the demand for castings, and all the foundries are taxed to their fullest capacity in filling orders.

James A. Eaton, a mechanical engineer, with offices in the Ajax Building, Cleveland, is preparing to erect a large machine shop in this city for the manufacture of a line of special machinery. He is now looking for a site, and expects to have the new plant under way in August and in operation in the fall. Mr. Eaton announces that he is in the market for the following machine tools: A 6 in. by 6 ft. lathe, 24 in. by 12 ft. lathe, 60 in. by 20 ft. lathe, 24 x 24 in. by 10 ft. planer, 48 x 48 in. by 18 ft. planer, one 20 in. and one 32 in. plain drill, 54-in. radial drill, 20-in. shaper, No. 2 milling machine, 2-in. bolt cutter and a boring mill. Considerable other machine shop equipment will also be required. The proposed plant will be operated by Mr. Eaton and his associates as a partnership. They are not yet ready to announce the kind of machinery that they will manufacture.

The Standard Tool Company has purchased the drill chuck business of the National Tool Company, together with the machines and stock on hand, and will make the manufacture of the chucks a department of its business. The National Tool Company will devote the full capacity of its plant to the manufacture of milling cutters, which it has been making in the past in addition to the chucks. The Standard Tool Company has found the capacity of its plant too small to accommodate its growing business, and has commenced the erection of a three-story brick addition, 50 x 125 ft. It has a large amount of business on its books at the present time and is running its plant overtime to fill its orders.

Plans for the new plant of the National Stove Company that will be erected by the American Stove Company at Lorain, Ohio, are being prepared by the Osborn Engineering Company, Cleveland. The main building will be about 60 x 450 ft. and two stories high. In addition there will be several smaller buildings and a new power plant. Work will be started soon, and the company expects to have the plant in operation in the fall. The capacity will be much larger than that of the old plant, which was recently partially destroyed by fire.

The Alliance Machine Company, Alliance, Ohio, is erecting a new machine shop and crane erecting room, which will be completed during the summer. The building will be 95 x 380 ft. and an exact duplicate of the present plant of the company, which it adjoins. When completed the combined buildings will have a ground floor space of 84,000 sq. ft., all under one roof. A new engine and boiler room is also being built, in which will be installed a duplicate of the present power plant. All the machinery for doubling the capacity of the plant has been ordered. The company has just commenced delivery on an order from the Indiana Steel Company, Gary, Ind., for 32 cranes, and has under construction several special cranes for the Duquesne plant of the Carnegie Steel Company.

The National Cash Register Company, Dayton, Ohio, which has been looking for a new site for its large plant for several months, has reached an agreement with the city of Dayton, and the plant will remain in that city, provided certain pledges are carried out. The company announces that it will erect a large iron foundry, enlarge its brass foundry and make a number of other additions to its plant. It also intends to enlarge its plants in Toronto, Ont., and Berlin, Germany.

Plans for the new plant to be erected by the Park Drop Forge Company have been prepared by the Osborn Engineering Company, and the contracts will probably be let this week. The main building will be 60 x 200 ft. The plant will adjoin the automobile factory of the White Sewing Machine Company.

The City Foundry Company has commenced the erection of an addition, 50 x 250 ft., to its plant on Hamilton avenue.

The Federal Graphite Company of Denver, Colo., is looking for a site for a new plant, and has about decided to locate in Warren, Ohio.

In order to handle its large business in electric generators and motors in southern Ohio, the Cleveland office of the Crocker-Wheeler Company, Ampere, N. J., has found it advisable to open a suboffice in the Cleveland Savings and Trust Building, Columbus. This new office will be in charge of Charles W. Frost, formerly of the Cleveland office.

Government Purchases.

WASHINGTON, D. C., July 2, 1907.

The Isthmian Canal Commission will receive bids until July 16, Circular No. 374, for steam shovels, unloader plows and other supplies.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until July 16 for motor drive outfits and other supplies for the Charleston Navy Yard.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until July 30 for two 100-hp. stationary water tube boilers for the San Francisco Navy Yard.

The following bids for supplies for the navy yards were opened June 25:

Bidder 5, The Armstrong Mfg. Company, Bridgeport, Conn.; 12, American Lumber & Mfg. Company, Pittsburgh, Pa.; 17, Atlantic Works, Philadelphia, Pa.; 23, Berlin Machine Works, Beloit, Wis.; 31, E. W. Bliss Company, Brooklyn, N. Y.; 48, W. N. Best American Calorific Company, New York; 51, F. S. Banks & Co., New York; 65, Columbus Pneumatic Tool Company, Columbus, Ohio; 69, Chicago Pneumatic Tool Company, New York; 82, D'Olier Engineering Company, Philadelphia, Pa.; 89, Detrick & Harvey Machine Company, Baltimore, Md.; 90, Drew Machinery Agency, Manchester, N. H.; 103, J. A. Fay & Egan Company, New York; 108, Fairbanks Company, Baltimore, Md.; 109, Walter H. Foster Company, New York; 110, Frevert Machinery Company, New York; 122, Greenlee Bros. & Co., Chicago, Ill.; 123, Nathan B. Gaskill, Philadelphia, Pa.; 126, General Electric Company, Schenectady, N. Y.; 128, Garvin Machine Company, New York; 144, Henshaw, Bulkley & Co., San Francisco, Cal.; 148, Alfred E. Hoermann, New York; 150, Hendey Machine Company, Torrington, Conn.; 160, Independent Pneumatic Tool Company, Chicago, Ill.; 161, Ingersoll-Rand Company, New York; 175, M. W. Kellogg Company, New York; 176, Kenworthy Engineering Company, Waterbury, Conn.; 180, Knox & Bro., New York; 185, Lucas Machine Tool Company, Cleveland, Ohio; 198, Matteson Mfg. Company, Chicago, Ill.; 214, Motley, Green & Co., New York; 215, Manning, Maxwell & Moore, New York; 220, Niles-Bement-Pond Company, New York; 231, National Electrical Supply Company, Washington; 233, Oliver Machinery Company, New York; 236, Pneumatic Appliance Company, New York; 237, Prentiss Tool & Supply Company, New York; 244, S. M. Price Machinery Company, Norfolk, Va.; 245, Pacific Tool & Supply Company, San Francisco, Cal.; 251, Rockwell Engineering Company, New York; 257, Railway Steel Spring Company, New York; 282, Standard Railway Equipment Company, St. Louis, Mo.; 321, Vermilye & Power, New York; 323, Vandyke, Churchill Company, New York; 338, R. M. Wilkinson Company, Norfolk, Va.; 339, Westinghouse Electric & Mfg. Company, Baltimore, Md.; 341, S. A. Woods Machinery Company, South Boston, Mass.; 344, R. A. & J. J. Williams Company, Philadelphia, Pa.; 347, Western Electric Company, New York; 348, Atlas Car & Mfg. Company, Cleveland, Ohio; 349, American Wood Working Machinery Company, Rochester, N. Y.; 358, Harron, Rickard & McCone, San Francisco, Cal.

Class 1. One motor generator set—Bidder 126, $7775; 339, $7693; 347, $9300; 348, $16,200.

Class 11. One shaper—Bidder 245, $575; 358, $790.95.

Class 12. One upright drill—Bidder 144, $414; 215, $365; 245, $325; 358, $339.

Class 21. One hand power brake—Bidder 110, $498; 144, $480; 321, $484.90.

Class 22. One ring and circle shears—Bidder 31, $1150; 144, $448.

Class 23. One bottom flanging machine—Bidder 144, $472; 257, $558.74.

Class 24. Four electrically driven blowers and spare parts—No bids.

Class 111. One vertical drill press—Bidder 215, $139; 220, $100; 237, $149.

Class 112. One pipe threading and cutting machine—

Bidder 5, $344.32; 51, $162.50; 90, $621 and $437.49; 109, $640; 110, $434; 215, $614; 321, $155.

Class 121. One motor driven engine lathe—Bidder 150, $1165; 220, $1070; 323, $1065.

Class 122. One independent dovetailer—Bidder 103, $570.

Class 123. One mammoth hot blast brazier—Bidder 180, $2240.

Class 124. One wood boring machine—Bidder 17, $400; 103, $425.

Class 125. Norfolk—One horizontal boring machine—Bidder 185, $1900; 220, $1950 and $1600.

Class 126. One cold metal sawing machine—Bidder 220, $1000 and $1775; 244, $1025; 323, $1040.

Class 127. One planer knife balancing machine—Bidder 90, $42.75; 103, $20; 110, $21 and $26; 244, $40.

Class 128. One automatic circular saw sharpener—Bidder 90, $192 and $78; 110, $218 and $78; 180, $197.50; 214, $170; 244, $165.

Class 129. One vertical triplex electric pump—Bidder 231, $185; 244, $198.

Class 132. One electric motor—Bidder 82, $496; 126, $357; 279, $290; 339, $237; 347, $350.

Class 133. One knife grinding machine—Bidder 17, $440; 110, $318 and $198; 198, $265; 341, $435; 349, $270.

Class 134. One band saw sharpener—Bidder 17, $170; 90, $259.75; 103, $305; 110, $242; 180, $244.75; 198, $235.50; 214, $262.26.

Class 135. One circular saw sharpener—Bidder 17, $200; 90, $214.50; 103, $205; 110, $218; 180, $200; 198, $158.50; 214, $184.19.

Class 136. One band saw setting and filing machine—Bidder 17, $100; 89, $100; 90, $127.50; 110, $122; 180, $124.25; 198, $40.

Class 137. One mortiser and borer—Bidder 103, $675; 349, $580.

Class 138. One dimension planer—Bidder 17, $3200; 103, $3335.

Class 139. One matcher and deck planer—Bidder 17, $1900; 23, $2375.50; 103, $2485; 349, $2155.

Class 140. One heavy timber planer—Bidder 17, $3500; 23, $3537.12; 103, $3790.

Class 141. One hand planer and joiner—Bidder 17, $450; 103, $610; 110, $508; 122, $470; 233, $470 and $624; 349, $447.

Class 142. One hand planer and joiner—Bidder 17, $600; 103, $715; 122, $498; 233, $682 and $732; 349, $552.

Class 143. One single automatic cut off saw—Bidder 103, $1429; 122, $1055.

Class 144. One double cylinder sawing machine—Bidder 103, $685; 233, $570 and $600; 349, $615.

Class 145. One combination saw and dado machine—Bidder 103, $567; 122, $640; 349, $506.

Class 146. One band saw mill—Bidder 103, $6934 and $7738.

Class 147. One band saw—Bidder 17, $350; 103, $505; 110, $369; 233, $459, $503 and $638.

Class 148. One band scroll and resaw machine—Bidder 103, $1350.

Class 150. One automatic blind stile mortising and boring machine—Bidder 17, $500; 103, $465.

Class 151. One tenoning machine—Bidder 103, $615.

Class 161. One plate heating furnace—Bidder 175, $4475 for chimney; 176, $10,795.50 and $10,559.31; 251, $10,789.

Class 301. Two lathes—Bidder 108, $1400; 128, $1620; 220, $1596.

Class 302. Two rotary drills—Bidder 69, $80; 244, $80.

Class 304. Twenty-four pneumatic drills—Bidder 69, $1260; 160, $1269; 161, $1710 and $1827; 282, $240, part.

Class 305. Twelve pneumatic hammers—Bidder 65, $369; 69, $420; 148, $309; 160, $450; 161, $408; 236, $408; 282, $100.

Class 306. One motor driven polishing machine—Bidder 108, $217 and $214; 110, $214 and $238; 214, $250 and $228; 220, $215; 244, $225.

Class 327. One electric motor—Bidder 339, $1228; 347, $930.

Class 352. Three fuel oil furnaces—Bidder 12, $600; 48, $720; 123, $630; 176, $617.49; 251, $620; 338, $1065.

Class 431. Four turret turning equipments, with motors and spare parts—Bidder 126, $13,384.

Class 457. One pattern makers' extension gap lathe—Bidder 214, $860; 233, $1241.

Class 458. One motor driven surfacer—Bidder 103, $1180; 336, $949.25.

The following awards have been made for supplies for the navy yards, bids for which were opened June 11:

Niles-Bement-Pond Company, New York, class 10, one engine lathe, $3320.

Powell & Colne, New York, class 1, one Tropenas steel casting plant, $8408.

Monarch Engineering & Mfg. Company, Baltimore, Md., class 6, two crucible tilting furnaces, $650.

Rockwell Engineering Company, New York, class 7, one double chamber furnace, $1640; class 175, one oil furnace equipment, $11,775.

Farrel Foundry & Machine Company, Ansonia, Conn., class 9, one alligator shear, $2590.

Harron, Rickard & McCone, San Francisco, Cal., class 11, one high duty shaper, $1240.

Brooklyn Forge & Supply Company, Brooklyn, N. Y., class 15, one pipe bending machine, $212.50.

Knox & Bro., New York, class 141, one improved batch revolving concrete mixer, $442.33.

Frevert Machinery Company, New York, class 151, one speed lathe, $234.

Hendey Machine Company, Torrington, Conn., class 152, one pillar shaper, $750.

Oliver Machinery Company, New York, class 171, one pattern makers' speed lathe, $211; class 184, one pattern makers' wood lathe, $860.

M. T. Davidson, Brooklyn, N. Y., class 178, one electrically driven plunger pump and spare parts, $650.

Jones & Lamson Machine Company, Springfield, Vt., class 172, one flat turret lathe, $1460.

Tate, Jones & Co., Pittsburgh, Pa., class 174, two heating furnaces, $365.

Williamson Bros. Company, Philadelphia, Pa., class 179, two steam winches, $1800.

Walter H. Foster Company, New York, class 182, one motor driven improved pipe cutting, threading and nipple machine, $1525.

Manning, Maxwell & Moore, New York, class 183, one band sawing machine, $525.

Northern Electric Mfg. Company, Madison, Wis., class 200, one motor and gear for converting belt driven lathe to electric operated machine, $1290.

Buffalo Forge Company, Buffalo, N. Y., class 201, seven forges and one motor driven fan for forge blast, $1162.50.

B. F. Sturtevant Company, Hyde Park, Mass., class 203, two blowers and engines, $1370.

Vermilye & Power, New York, class 291, eight triplex ammunition trolley hoists, $572.

Independent Pneumatic Tool Company, Chicago, Ill., class 331, one pneumatic drill, $59.75.

Ingersoll-Rand Company, New York, class 332, one pneumatic hammer, $34.

Columbus Pneumatic Tool Company, Columbus, Ohio, class 333, two chipping hammers, $69.

Richard W. Geldart, New York, class 334, one valve reseating machine, $325.

John B. Roache, New York, class 335, eight hydraulic jacks, $155.40.

George F. Blake Mfg. Company, New York, class 336, one vertical circulating pump, $1006.

Platt Iron Works, Dayton, Ohio, class 362, five steam driven torpedo air compressors, $18,000.

Under bids opened June 12, circular No. 368, for supplies for the Isthmian Canal Commission, the Lambert Hoisting Engine Company, Newark, N. J., has been awarded class 13, six hoisting engines, $6086.70.

The following awards have been made for supplies for the navy yards, bids for which were opened May 28:

Crescent Machine Company, Leetonia, Ohio, class 34, one band sawing machine, $500.

Niles-Bement-Pond Company, New York, class 38, one radial drill, $4900.

Knox & Bro., New York, class 208, one slitting shear, one circular shear and one hand punch, $283.

The following awards have been made for supplies for the Isthmian Canal Commission, circular No. 366, bids for which were opened May 28:

Motley, Green & Co., New York, class 1, one centering machine, $115; class 3, one bar cutter, $2325.

Prentiss Tool & Supply Company, New York, class 2, one drilling machine, $1050.

The following awards have been made for supplies for the Isthmian Canal Commission, bids for which were opened May 17, circular No. 363:

Manning, Maxwell & Moore, New York, class 9, one cylinder boring machine, $1141.09; class 13, one pillar crank shaper, $928.70; class 16, one pipe cutting and threading machine, $907.43; class 17, two cylinder facing machines, $293.46.

Motley-Green Company, New York, class 1, one planer, $3521.25; class 29, one flue welding machine, $685.

Niles-Bement-Pond Company, New York, class 3, two radial drills, $3050; class 14, one crank slotter, $1770; class 18, one driving wheel lathe, $6140; class 21, one screw cutting lathe, $1098; class 23, two screw cutting engine lathes, $1425; class 27, one hydrostatic wheel press, $1890; class 28, one hydrostatic beam and angle bending machine, $2160.

Prentiss Tool & Supply Company, New York, class 5, one boring and drilling machine, $2237; class 7, three drill presses, $460.50; class 8, one drill press, $179.

Joseph T. Ryerson & Son, Chicago, Ill., class 4, one countersinking radial drill, $450; class 30, one rotary splitting shear, $1374; class 31, one single punch, $298.

Hallidie Machinery Company, Seattle, Wash., class 11, one plain milling machine, $1011.44; class 19, one engine lathe, $1670.36.

Frevert Machinery Company, New York, class 15, one bolt cutter, $665.

Fairbanks Company, New York, class 22, three screw cutting engine lathes, $1905; class 25, one cabinet turret brass lathe, $485.

Deane Steam Pump Company, New York, class 32, one steam pump, $496.15.

Pilling Air Engine Company, Detroit, Mich., class 50, six pneumatic gear hoists, $1305.

Under bids opened June 21, circular No. 370, for supplies for the Isthmian Canal Commission, the following awards have been made:

Manning, Maxwell & Moore, New York, class 16, one single phase motor, $166.85.

Frevert Machinery Company, New York, class 17, six tool grinders, $942.

Vought & Williams, New York, class 21, one upright drill, $20.90.

Conn cticut Industrial July Dividends.

The list of July dividends declared by Connecticut manufacturing industries, as compiled by a Hartford banking house, shows the prosperity which has been enjoyed during the first six months of the year. Some of the figures are only estimated, as designated:

American Hardware Corporation, New Britain, 1¾ per cent. quarterly, an increase from a 6 to 7 per cent. annual rate; Billings & Spencer Company, Hartford, 1½ per cent. quarterly regular, and 4 per cent. extra dividend, the latter being increased from 2 to 4 per cent. annual; Colt's Patent Fire Arms Mfg. Company, Hartford, 1¼ per cent. quarterly, an increase in annual rate from 4 to 5 per cent.; Collins Company, Collinsville, 4 per cent. semiannual, estimated; Eagle Lock Company, Terryville, 3 per cent. quarterly, estimated; International Silver Company, 1 per cent. quarterly, estimated; Johns-Pratt Company, Hartford, 5 per cent. quarterly; Landers, Frary & Clark, New Britain, 2 per cent. quarterly, estimated, on an increase in capital stock from $1,000,000 to $1,250,000; New Britain Machine Company, New Britain, 1½ per cent. quarterly; Pratt & Cady Company, Hartford, 2½ per cent. quarterly, estimated, an increase in annual rate from 8 to 10 per cent.; Peck, Stow & Wilcox Company, Southington, 2½ per cent. quarterly, regular, and 5 per cent. extra, estimated; Standard Screw Company, owner of Hartford Machine Screw Company, preferred 3 per cent. semiannual, estimated, common, 3 per cent. semiannual, estimated, the latter an increase from 5 to 6 per cent. annual basis; Stanley Works, New Britain, 2 per cent. quarterly, estimated, on an increase in capital stock from $1,000,000 to $1,500,000; Stanley Rule & Lever Company, New Britain, 2 per cent. quarterly, estimated; Union Mfg. Company, New Britain, 2 per cent. quarterly, estimated, an increase in the annual rate from 6 to 8 per cent.; Whitlock Coil Pipe Company, Hartford, 1¾ per cent. quarterly, estimated.

A hoist operated by a single-phase motor and designed especially for hoisting brick, mortar or concrete in wheelbarrows has been used by a Chattanooga contractor with singular economy. By cable the hoist operates two platforms moving side by side, one being raised while the other descends. The driving shaft runs continuously, the driving sheaves on the hoist being controlled by a lever. The brake is automatic. With a 3-hp. motor the hoist weighs 1200 lb., has a lifting capacity of 500 lb. at a speed of 250 ft. per minute, and will raise 50,000 brick, with mortar, per day. The contractor found that he raised 700,000 brick, with mortar, for a total electric energycost of $13, or a little under 2 cents per 1000. With the hoist operating at full capacity the cost for operator, who need not be a skilled man, might be placed at $1.50 per day, or 3 cents per 1000 brick. This would make the total current and labor bill 5 cents per 1000.

The Ashtabula Steamship Company was organized last week with a capitalization of $300,000 and has closed a contract with the Great Lakes Engineering Works, Detroit, for a lake freighter of 7500 tons capacity. The boat will come out at the beginning of next season. A number of Cleveland, Ashtabula and Erie men are interested in the new steamship company.

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HARDWARE

THERE has been of late some evidence of the development of a hostile feeling on the part of some retail merchants toward what, for the want of a better term, is called the publicity advertising of manufacturers and merchants, who through the medium of magazines and papers of a general circulation endeavor to increase sales of their specialties or other products thus brought to the attention of the public. Judging by some expressions made at the recent convention of the National Retail Association, many Hardwaremen seem to look on this advertising with scant favor and are even in some cases inclined to take an antagonistic attitude toward the manufacturers or jobbers who resort to it. This is unkind, if not pathetic, as the manufacturers have in many cases at least adopted this method, having in view the benefit of the retail merchant, hoping that in this way a demand for the goods in question would be stimulated or started, so that calls for them would be made upon the local Hardwareman, to whom, according to the theory of the advertisers, an opportunity would thus be given to make sales which otherwise might not be effected. The case seems all the harder when manufacturers in their desire to help the retail trade refer to them any inquiries from persons in their towns or cities, so that they may be followed up and the local merchants get the direct advantage of the sale. Regarded as an effort to assist the retail merchant, this publicity advertising should certainly be looked upon with warm approval and appreciation, and merchants should with alacrity do their part toward making it tributary to their own business.

There is reason to believe that some merchants who are accustomed to improve their opportunities, who are prompt in adapting themselves to new situations and in adopting methods a little out of the common, welcome these efforts to interest the public in the specialties thus advertised. There are, however, we regret to record, other merchants who assume a different attitude and have little sympathy with this means of marketing goods. Their indifference or opposition would seem to have as one of its elements a feeling of suspicion, as if there were something of a menace to their trade in having the manufacturers thus advertise directly to the public, even though the readers are in many cases referred on the face of the advertisement to the local merchants, while if any inquiries are sent to the factory they are, in the Hardware field at least, generally turned over to the trade from whose territory they come. There is no doubt, strange as it may seem, that some merchants give a very cold welcome to such inquiries reported to them by the manufacturers, and indeed do not greatly care to have persons come into their stores asking for something they have seen advertised, but which is not carried in stock by the merchant thus approached. They seem to look upon this method as adopted by the manufacturers with a view to constraining them to handle the special line or particular article advertised. So sensitive are they on this point that an inquiry made in good faith by a person who desires to see the goods and probably to purchase occasions something like annoyance, as if in this way the manufacturer were using an unfair method of inducing the trade to handle his products! Many merchants report that the names of inquirers given them by the merchants result in comparatively few sales, so that it often does not in their opinion pay to follow them up. It may indeed be that the indifferent manner in which the matter it attended to, together with the fact that the methods of the establishment do not provide for effective outside or aggressive work of this character, has a good deal to do with the unsatisfactory outcome of such efforts.

The fundamental question in regard to such advertising is whether or not it pays the manufacturers. It is certainly easy to waste money in this way, securing very inadequate returns for large sums expended. In special cases where a manufacturer has a novelty which makes a wide and practically universal appeal, there is little doubt that such advertising can often be used advantageously, but whether it pays in connection with the sale of a general line or of ordinary trade articles is very doubtful. It is, however, for each manufacturer to determine this for himself, making as costly experiments as he pleases in this direction. So far, however, as the trade is concerned, there is no doubt that such advertising is beneficial. It brings to the attention of the public articles of which otherwise they might be ignorant and suggests the desire of acquisition, which in many cases is apt to lead sooner or later to inquiry or purchase. It thus stimulates interest in the class of goods to which the advertisement relates and makes it easier for the merchant to sell similar articles. All this is directly to the advantage of the trade, and so far as Hardware articles are thus advertised, it enlarges the Hardware field. Local merchants are certainly enabled to effect some sales which are so much clear gain. It sometimes brings to them inquiries of which, if they are alert and enterprising, they should be able in one way or another to take advantage.

While there are comparatively few Hardware manufacturers who will find that general "publicity advertising" gives them satisfactory returns for the great expense involved, it ill becomes the merchants, wholesale or retail, to oppose such advertising, for so far as they are concerned it will be to thei radvantage, if they are sufficiently wise and energetic to make the most of the opportunity presented.

Condition of Trade.

The half year closes with a very satisfactory record, comparing well with that of 1906. With some merchants and manufacturers it has been characterized by a larger volume of business than was enjoyed in the same period of last year, and with comparatively few has there been anything of a serious falling off. There has been, as there was a year ago, more or less apprehension of a relaxing in business, and owing to the climatic conditions a good deal of solicitude has been felt in regard to the crops. All this has doubtless had its effect on the demand for goods. Notwithstanding these somewhat adverse influences trade has been maintained remarkably well, and July opens with many past due orders on the books of manufacturers and a good quota for future shipments, although the trade generally have not been buying in as large quantities or for as long a time ahead as has frequently been their practice during these years of prosperity. Prices have been feeling the effect of the long continued large demand and the increased cost for material and labor, as well as a growing expense in con

nection with all the machinery for marketing goods. The comparatively high level thus reached is being maintained with comparatively few advances and fewer declines. Good weather is apparently doing great work with the crops and contributing much to the cheerfulness and confidence of the trade. At the same time it stimulates the tardy movement of summer goods, and merchants, wholesale and retail, are getting rid of stocks, some of which they were apprehensive they might have to carry over. There is less complaint about slow delivery of freight, owing, in part at least, to the increased facilities and better management of the railroads, as well as a more reasonable use of cars by shippers and consignees, avoiding needless delay in loading and unloading them. The establishment of increased minimum carload weights which go into effect next month is another effort in this direction, and while it may occasion some merchants a slight inconvenience it should be welcomed as tending to help the traffic situation. Taken all in all, the outlook for the remainder of the year is decidedly encouraging, especially in view of the more hopeful reports from the crops on which the prosperity of the country so largely depends.

Chicago.

With the rounding out of the first half of the year comparisons with like past periods are in order. It is, however, too early to state the results of such comparisons with accuracy, since the tabulation of accounts has not been fully completed. But enough is known to give assurance of a favorable showing. It is believed that, though the volume of last year's business was regarded as phenomenal, that for the corresponding period of 1907 will at least equal and perhaps surpass it. Of the causes for complaint that have so far arisen, the most conspicuous have had their origin in too much, rather than too little, business. Vexatious delays in the delivery of goods growing out of overcrowded mill and factory conditions have been universally experienced. But much improvement in this direction is now evident and an early return to a more nearly normal state of affairs in most lines is anticipated. All things considered, trade holds up remarkably well. Indeed, it is remarkable that in the face of discouraging and even alarming reports of crop damage, depressing financial fluctuations and panicky stock markets it should be so little affected. There are signs now of a lessened demand through the summer months, when a slackening up is regularly expected. News from the South and Southwestern cotton fields indicates that as many as three replantings have been necessary, and on this account the crop will be very late. If favored by a late warm fall most of it will safely mature, but an early frost would under the circumstances be disastrous. With the beginning of the second half many manufacturers are beginning to work on higher priced stock and talk of further advances is again heard. Between the continued strength of demand and tardy shipments scarcity of Wire Nails is still reported.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Since our last letter we have been blessed with some real summer weather, which has had the effect of moving seasonable goods to an extent which is very greatly appreciated. Our retailers had almost despaired of turning their stocks at all, but are now in full swing, and with the continuance of good weather will no doubt find a satisfactory business.

As far as our observations are concerned there is very little change to note in general trade conditions throughout the country. This is the season of the year when there is always a tendency to ease up, vacations are being prepared for, and many salesmen take this time for a relaxation period. We find very little change, if any, for the six months just past, as compared with the corresponding period for 1906, sales being up to expectations. The demand for season goods seems to have no let up and indeed in some lines it is almost as hard as ever to get goods, and quite unsatisfactory to customers who have to wait.

In the building line there seems as much activity as formerly. Building permits issued in Philadelphia up to June 1, while they did not equal in number the five corresponding months of 1906, yet in value they exceeded them by over half a million dollars, which shows that in spite of high prices for very many commodities in the building line they have not deterred operations to any noticeable extent.

There have been no changes of any moment to note in the Hardware line. We trust the favorable weather conditions may continue, which, by the way, we learn from some of our Southern friends has made a wonderful improvement in the prospect of the cotton crop. Corn, of course, is backward, owing to the deluge of rain and, while the crop will be late, we trust it may be more plentiful than seems to be the general expectation. Collections remain about as usual.

Boston.

BIGELOW & DOWSE COMPANY.—Everything is rushing and June is the banner month, breaking the record for several years. Warm weather makes a lively demand for seasonable goods. The early sales of Screen Doors and Wire Cloth were light, on account of the cold weather, but now the many orders are depleting the stocks in jobbers' hands, and it looks like there would be a shortage.

Retailers are busy, but it is a question if they are making the profit they should on their sales. The habit of continuing to sell at old prices after goods have advanced is a bad policy that many think is a necessity which forces their competitors to follow their lead. Formerly this policy could be continued at a small loss when competition among manufacturers made it impossible to maintain a high range of prices for any considerable time. To-day consolidations, combinations and trusts control the market prices and prevent the former rapid demoralization on the first sight of danger. Strong men control these organizations and merchants have confidence that they will act wisely. A steady, even market works for the benefit of every one. A conservative estimate of the advance made on a general stock of Hardware during the past year is from 5 to 7½ per cent.

Prices of Copper and Brass goods seem abnormally high, but considering the high price of the base metal it is a question if the manufacturers are making unusual profits. Considering the higher prices paid for labor, Hardware made from iron and steel has advanced only in fair proportion to its additional cost.

Taking this view of the present situation, the market should continue on its present basis until there is a material reduction in the cost of both metals and labor. Like the tariff, we can see where some changes could be made to advantage, but taken as a whole we prefer to leave prices as they are.

If costs are to remain at the present standard would it not be well for the retail merchants to make their usual profits on their present costs rather than be losers waiting for lower ones?

The warm weather is filling the seashore and country with our usual quota of summer guests from nearly every State in the Union. The National Retail Hardware and the New England Hardware Dealers' associations have been with us for a week and have returned to their homes to sound the praises of Boston as a convention city and with happy memories of a very pleasant reception tendered them by the Hardware manufacturers of New Britain.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—June business has been quite satisfactory, and upon the whole this can be said of the business for the first half of the year, which compares favorably with that of 1906. For several months the weather was unusually cool and crops were backward, but a fair acreage was seeded and generally in good condition and June has brought things forward

with a jump. In some sections there has been more rain than was needed, and, on the other hand, in part of western North Dakota too little rain has fallen.

Taking it altogether crop conditions now are good, though somewhat backward. Corn probably promises the least favorably. The grasses have come on finely and pasturage is abundant, and the hay crop generally is assured. This is a very large factor in the situation. It is too early to predict with any certainty the outcome of the wheat crop and other small grains, but the promise is now for an abundant harvest.

Minnesota has never appeared more beautiful than it now appears during these June days, with its fields of grain and grasses, its woods with their magnificent foliage, and its wonderful chain of interior lakes that reach throughout the entire State.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Since our last report the improvement in the condition of crops in the South has been so marked that it is already being felt in trade. This is about the dullest month in the year for the Hardware business, and most Southern jobbers take advantage of this time to look after their annual inventories and give their employees an opportunity to enjoy a vacation. No great amount of business is expected at this season, but the growing crop is developing very rapidly and is watched with a very great deal of interest, as on it depends so largely the business of the future.

Collections are very good, and if we have favorable weather during the summer and a late fall, there is no reason why we should not expect a splendid crop and a good fall trade.

Cleveland.

THE W. BINGHAM COMPANY.—A larger number of orders have been received through salesmen and direct from customers by mail during the month of June than were sent in last year at the same time, and the first six months of 1907 will round up with a greater amount of business in the aggregate than a year ago during the same period.

Hardware of all kinds is low in price, and it takes a great many articles and good quantities to amount to $100, and it costs more to do business now than formerly on account of the large number of orders we are handling for various kinds of goods. Owing to the unsettled weather we have had in the last 60 days merchants have been buying often and in small quantities, but when we have more settled weather dealers will increase the quantities on their orders and enlarge their stocks.

Orders are coming in freely now for fall shipment of Ice Skates, Stove Boards, Axes, Sheet Iron, Stove Pipe, Coal Hods, Elbows, Dampers, Lanterns and other kindred goods. Also in anticipation of an advance in price, which we certainly can expect, many orders for Lawn Mowers are being placed for next season. Some jobbers have been enabled to contract for next season's business at favorable prices, and are willing to give their customers the benefit of them, so they will place their orders with them earlier than usual.

The general line of Hardware is moving along in good shape, but our sales would be very much better if it were not for the unsettled condition of labor. Many anticipated jobs are held up on account of labor agitation. This, however, is quieting down in most districts, and contracts will be placed for a lot of buildings during the summer and fall, and as house trimmings are low in price, considering the quality, we expect a larger business than we are having just at the present time. A large tonnage of Nails, Sash Weights, Joist Hangers, Merchant Pipe, Fittings, &c., of the sizes and kinds that must go into buildings first are being called for and going forward, indicating that very soon we will have call for the higher class of Hardware and trimmings to finish up the buildings.

Manufacturers are catching up on back orders, and jobbers are in better shape now to fill their orders than they have been for quite a while. Files, Screws and Bolts at present prices are a good purchase.

A great many camping outfits are being sold. Guns, Ammunition, Fishing Tackle, &c., are in good demand. In the larger cities and towns many people spend their vacations in the country districts, and they require an extra lot of Hardware and other supplies to make themselves comfortable, thus creating a demand for many kinds of Hardware to fit up summer homes.

We are coming now to the time of the year when employees expect to take their summer vacations, and, of course, those who remain at home will have an extra amount of work to do for the next 60 days, and it will take some night work to keep up. Americans are restless and like a change, and want to be on the move, and, as they are enjoying good wages, they spend their money freely for luxuries, as well as necessities.

On the whole, trade and traffic are very good. Collections are fairly satisfactory for this time of the year.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—Business during the month of June throughout the Trans-Missouri region has been very satisfactory. A free movement of goods continues uninterruptedly, and although agriculturists are just now busy in the fields, still the volume of trade is very good and well up to expectations.

Owing to continued changes in the weather conditions outside operations have been somewhat delayed, but every favorable opportunity is promptly taken advantage of to push forward necessary work. Frequent rains have moistened the soil until it is declared to be in excellent condition, and it is estimated that the acreage under cultivation is larger this year than ever.

All kinds of labor are well employed; in fact, there is a decided shortage. All that is needed now is favorable weather for the ripening crops, and with this important feature assured general business for the latter half of the year will undoubtedly prove very satisfactory.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Indications for the large money fetching crops still continue favorable. The last week or two have been warm, bright and seasonable, and we hear no complaints, except from the small fruit growers in this vicinity, where we had a late killing frost. Fortunately we have a large country, and some part of it is bound to laugh, even though another be in mourning. The rapid interchange, always possible, of perishable commodities like fruit, makes us forget our own garden's unproductiveness, so if Georgia will send on the peaches and watermelons to take the place of pineapples and grape fruit in the summer-time, all will be reasonably well. The supply seems regulated by the price to reverse the old theory. If we are only ready to pay, we shall never know that the cherries and berries in our backyards are not behaving as well as last year.

The large orders given by the railroads for cars, rails and equipment generally, forces the belief that there will be no dearth of mill business for a good while to come. It is held down to present proportions solely by the closeness of the money market, and the unwillingness of banks and lenders to put up capital for new or enlarged enterprises. There again it is a matter of price. It is a question with political economists of to-day as to whether the money has simply not appreciated with other things, and that we are finding ourselves on a permanently higher scale of interest charges. A few years ago 3½ per cent. bonds of this city sold at a premium. Now it is extremely difficult to get 4 per cent. bonds for sewers and other strictly legitimate municipal undertakings to go at par. This, too, in spite of the fact that they are nontaxable in the home city itself. However, to those who have an income beyond expenses this is good news, for what money they have to lend will be made to yield more, and even life insurance companies, which have used as an argument for their smaller dividends, the decreasing value of loans will have to revise their dividends, and should do so in favor of their policyholders.

Locally, we are somewhat disturbed by the strikes among the building trades, not for shorter hours or better wages (these having been recently attained), but strictly for the "open shop." So far the embarrassment has not been very material, due somewhat to the bi-color factor in our Southern labor world.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—As usual the writer is extremely optimistic about business conditions in this section, but he believes that his optimism is justified by present conditions. This city continues to hold its place at the head of the list of building permits for cities of its size. The bank clearings continue to increase amazingly and general conditions continue favorable to a still further increase in business.

As far as our lines are concerned, the only drawback to the outlook is the continued impossibility of getting goods as fast as we can sell them. At present this is particularly true of Nails, for the manufacturers' stocks have long been exhausted in this territory, and the stocks of all the jobbers have been badly broken up, and it seems to be impossible to get Nails from the East in anything like the time we should. This condition is also true to a greater or less extent of all Heavy Hardware, and in consequence all jobbers in this territory are not making the sales or the profits which they could make were they able to fill up their stocks. We hope, however, that this condition will, in a measure, be remedied shortly, though possibly the wish is father to the thought.

The car shortage situation is considerably better than it was earlier in the year, and the railroads are making better delivery, but the business offered them still far exceeds the capacity of their equipment and terminal facilities. After cars have arrived at their destination it takes from three days to two weeks to get them unloaded, so great is the congestion.

Natural conditions were never better in this territory. All crops promise finely and all prospects are for good prices. The lumber business is still increasing in volume and promises to be wonderfully favorable this year. Collections continue excellent, a large number of buyers discounting their bills.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Beautiful weather is the order of the day. Notwithstanding pessimistic reports—especially from the East—business throughout June was very good. June sales show a substantial increase over last year.

We are now having troubles as a result of vacations. Those who stay at home are doing the work of those who are away. This is very pleasant. It gives us a chance to vary the monotony by working at night on the other fellow's job. When your house gives you a vacation—especially if they pay your salary while you are away—it is a good time for you to leisurely look around for another job. You might be able to "better yourself." Whenever vacation time comes we receive personal calls from the employees of other houses seeking to better themselves. I presume other houses receive similar calls from our employees. Therefore vacation time after a while will be the proper time for dissatisfied employees to shift themselves from one house to another.

All this reminds me of what a salesman once told me about small towns. He said: "Did you ever know people hate harder and longer and more in small towns than they do in large towns?" I told him I had not observed it. "Then," said he, "study this proposition and you will find it is true." I asked why. "Just because in a small town they have more time to nurse their hatreds." Since then I have studied this out, and I believe there is some truth in it. A busy man has little time to hate.

So when vacation time comes banish all pleasant thoughts. Nurse any particular grievance you happen to have. Think it over carefully while you are swinging in a hammock. Work yourself into a "stew" about it. Then hunt another job. No doubt the other fellow will appreciate you more and allow you to do just as you please.

Prices continue steady, but we note there is more "reaffirming" of old prices than advances. Manufacturers who have been carefully, calmly and judiciously considering advancing their goods the past two years will now have to wait until next time—the wave has passed.

One of our great merchants told me recently his house tried the temper of the manufacturers by sending out cancellations. Answers to the letters of cancellation were studied with great care. Some manufacturers wrote, "With pleasure. We are overloaded with orders." Others wrote, "Your instructions carried out. Orders canceled." No further remarks. Still others wrote, "Goods have been made up and it would be an injustice and a hardship for us to have to cancel the orders." He said as a result of this experiment his house had decided it was not yet a buyer's market; that the majority of manufacturers they had written seemed to be perfectly willing to accept the cancellations.

This merchant does business in all parts of the United States. He told me they felt perfectly safe in regard to this fall's business, crop or no crop. He said the country was full of money and the farmers out of debt. He stated it was their opinion if we have poor crops we would not feel the effects until next spring. He told me they were instructing their buyers to purchase "full up" for this fall, but to be exceedingly conservative in placing orders for next spring.

The general trade do not realize that on most lines jobbers are compelled to place their orders so far ahead that at this time specifications have all been placed for business clear up to the end of the year. Even if a jobber desired to be extra conservative just now he could do very little in the way of holding down purchases except for next spring business. While we ourselves believe in conservatism, we are not at all worried about the approaching fall business. We anticipate a good business and we intend to do our best to have a good stock and a complete assortment of goods to take care of it.

If some manufacturers are prompt in their shipments, after all the delays in the past few years, it will be a cause for rejoicing. If these same lines continue short in normal times it may be a good idea for jobbers to get together and start a few factories of their own to take care of the demand, or let down the tariff bars and give our friends across the ocean a chance to pay for some of our wheat and corn and other products in goods that our American manufacturers do not seem to have the capacity to supply.

New Orleans.

WOODWARD, WIGHT & CO.—The general business condition here has shown for the last 30 days a gentle but continuous improvement. In February, March and April almost all lines of trade in New Orleans were extremely dull. There was a general waiting throughout all the territory tributary to see what was going to happen, and a cutting down of stocks in the hands of merchants and more or less general house cleaning. This conservatism at that time had a very good effect, and since the last week in May orders have been coming in more freely, not only in the Hardware line, but in all the other lines of wholesale trade in this section.

The brokers, of whom there are a large number in this city, and who sell to jobbers, say that conditions in the grocery, dry goods, mill supply and machinery trades are much better than they have been for quite a while back. Money is still hard to get, but nowhere near as hard as it was in the early part of the year.

The prospect of all crops in this section is now very much better. The rice crop has shown a marked improvement; sugar prospects are remarkably good. In lumber, while the car manufacturers still hold off buying, yet there is generally a much happier feeling among the mill owners, and a belief that in the next 30 or 60 days we are going to see prices react. The prices of lumber dropped off in the early part of this year about $5 a 1000 on export bills and $2 to $3 a 1000 on interior trade. They are still approximately at these figures, and while there is no immediate prospect of a rise in the export price, yet the interior market is looking so much better that the general opinion now is that prices may react to their December level. Even at the present price, however, there is still a very handsome margin for the lumbermen.

Reports about the cotton crop are generally very highly colored by the tendency of the person making the report. The large habitual bear houses here think that we are going to have a large crop, and that the reports

of damage are very much exaggerated. The people who are habitually bullish and those who are sometimes one way and sometimes the other, however, consider that the crop is going to be very short and spotty; that is, some localities producing as much as they have in a banner year and others producing practically nothing. These last two classes believe that the cotton crop, however, is going to leave in the South about as much money as it left last year. There is still a good deal of cotton left in the hands of the large planters from the 1906 crop.

The taking over by the Government of the Isthmian Canal Commission and practically turning it over to the United States Engineer's office is undoubtedly going to result in a great increase of trade for this city with the Isthmus, as we are two or three days nearer Colon than New York City is. Arrangements have been completed with the United States Fruit Company here by which its passenger and freight service to Colon will be practically doubled, and the major part of all the employees for the Isthmus will go through New Orleans instead of New York as heretofore, the Commission getting a lower passenger rate than through New York, and in addition saving a few days' pay of the men each way.

Real estate is not finding as ready a sale as it did at this time last year. What little property has gone on the market, however, has brought practically the same price as it did a year ago. Local bonds and stocks are considerably lower than they were last summer. That is, stocks that were selling at that time at about 90 are now being sold at 81 to 84.

While New Orleans is vitally interested in lumber, sugar, rice and cotton, yet it should be remembered that the rice crop and the sugar crop, unlike lumber and cotton, leave all their money here in the city; that is, the financial elements of these industries are not so highly developed as they are in cotton and lumber; that when the crop of sugar and of rice is sold and paid for, the money from this practically stays in New Orleans banks until the planter uses it up the next year in making that year's crop.

There has been a steady and continuous increase of about the same amount every year in the receipts of our street railway company from passengers; that is, every year for the past three years they have been carrying from 10 to 12½ per cent. more people than they did the previous year. There has, therefore, undoubtedly been a large increase in the population of the city in that time.

NOTES ON PRICES.

Wire Nails.—Notwithstanding the lateness of the season demand continues large, with many specifications on contract orders, and a fair amount of new business. Deliveries continue slow, occasioning inconvenience to the trade. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.00
Carload lots, to retail merchants	2.05

New York.—Delays in shipping orders from mill still keep jobbers' stocks more or less broken in assortment. The local market is fairly well maintained, with the exception that sometimes Hardware jobbers sell Nails at less than regular quotations to effect the sale of other goods. New York jobbers' quotations are: To retailers, carloads, on dock, $2.19; less than carloads, on dock, $2.33; small lots at store, $2.30.

Chicago.—The demand for Nails is remarkable for its persistent strength, and shows practically no abatement. Not only are specifications being furnished in large volume, but new business is coming forward at a rate almost unprecedented at this season of the year. Deliveries are still slow and much complaint is heard from dealers, who are subject to much inconvenience occasioned by delayed shipments. Quotations are as follows: $2.18 in car lots to jobbers and $2.23 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Demand for Wire Nails continues very good, despite the lateness of the season. Jobbers' stocks are only normal, although the mills have had a good car supply, and have been able to ship their accumulations. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days.

Carloads, to jobbers	$2.00
Carload lots, to retail merchants	2.05

Cut Nails.—There is a fairly good demand, and less concessions from regular quotations are reported. This is the season when mills usually close down for inventory taking and repairs, and this should have something of a strengthening effect upon the market. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $2.05; less than carloads, to jobbers, $2.10; less than carloads, to retailers, $2.20. Iron Cut Nails at points west of and including Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

New York.—There is comparatively little trouble in getting fairly prompt shipments from mill, so that jobbers' stocks show a better assortment. The market is generally maintained, but jobbers of Hardware sometimes sell small lots of Nails at less than jobbers' regular quotations to secure business in other lines. New York jobbers' quotations are on the basis of $2.30.

Chicago.—A somewhat less active demand is noted, but trade on the whole is fair. Mill prices, which were showing signs of softening in spots, will find support in the shutdown of two mills, which it is reported will not resume for a couple of months. Quotations are as follows: Iron Cut Nails, car lots, to jobbers, $2.33; to retailers, $2.38; Steel, to jobbers, in car lots, $2.23; to retailers, $2.28.

Pittsburgh.—Demand is fairly good, and it is only occasionally that mills make concessions from regular quotations, which are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $2.05; less than carloads, to jobbers, $2.10; less than carloads, to retailers, $2.20. Iron Cut Nails at points west of and including Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

Barb Wire.—Specifications on contracts are being received in good volume by the mills, but new business is light. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.15	$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Chicago.—New orders are still being booked, though it was thought some weeks ago that trade for this season was practically over. Mills are making headway very slowly in catching up with deliveries. Shipments are heavy, and should soon favorably affect the situation. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.33; Galvanized, $2.63; to retailers, car lots, Painted, $2.38; Galvanized, $2.68; retailers, less than car lots, Painted, $2.50; Galvanized, $2.80; Staples, Bright, in car lots, $2.30; Galvanized, $2.60; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Mills are able to ship freely, as the car supply has become adequate. New business is light, but specifications against old contracts continue of good volume. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.15	$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Smooth Fence Wire.—Contract specifications are good and some orders for future delivery are being placed by Fence and Woven Wire manufacturers. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed.....	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized....	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—The conditions governing other departments of Wire Goods are shared in full here. Manufacturers of Fence and Woven Wire are placing forward orders, and deliveries, though slightly better, must be much improved before the situation is again restored to normal. Quotations are as follows: In car lots, to jobbers, $2.03, f.o.b. Chicago, and to retailers, $2.10.

Pittsburgh.—Specifications against old contracts are good, but not a great deal of new business is coming in. We quote, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.85
Retailers, carloads	1.90

Snow Shovels.—Heavy orders for Snow Shovels from the large jobbing trade have been booked by the manufacturers since the opening of the market. Prices are decidedly firm, representing an advance over last season's schedules of about 50 cents per dozen. This change, it may be assumed, will be reflected in quotations to the retail trade, which will probably stand at about $3.50 per dozen on long handled and $4 on D handled Shovels. Although there was not much snow the early part of last winter, the latter part of the season was marked by frequent and heavy falls in many sections, so that it is believed stocks of Shovels were fairly well reduced and demand will be reasonably good next year.

Hand Screws.—Under date of July 1, announcement has been made by leading makers of Hand Screws that in deference to a request made by the National Hardware Association, they have advanced their list prices so that it will be possible to quote greater discounts. An idea of the extent of the change may be gathered from the fact that goods formerly listing at $12 have advanced to $40 list.

Hickory Handles.—Turner, Day & Woolworth Handle Company, Louisville, Ky., has issued a new price-list of Hickory Handles, representing advances on many lines in common use of from 10 to 15 per cent. The scarcity and high price of suitable timber is referred to as the cause of the change.

Binder Twine.—The market is alluded to as being held quite firm, considering conditions which have prevailed in crops. There is no doubt that schedule prices have been shaded, but reckless price cutting does not appear to have been indulged in. With the nearer approach of harvest buying has increased to some extent. Winter wheat and oats harvest is likely to be a week or more later than the average time. Spring wheat has been improved by favorable weather, with an outlook for a better crop. Prices are somewhat irregular, but the following may be taken as a guide to the market: Sisal and Standard, 9 to 9⅝ cents; 600 ft. Manila, 12 cents; Pure Manila, 13¾ to 14 cents per pound, with usual discounts for large lots, central delivery.

Rope.—During the past week buying has shown an increase over that of the preceding two weeks, and manufacturers feel encouraged. However, July and August are not usually expected to be heavy months in the cordage business. Under these conditions card prices, represented by the following quotations, are not adhered to in all instances, with the exceptions of Bolt and high grades of Manila Rope, which are maintained. Quotations are as follows: Pure Manila, 13 to 13½ cents; B quality, 12 to 12½ cents. Pure Sisal, 9¼ cents; No. 2 quality, 7¾ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

Window Glass.—The volume of inquiries is reported as being larger than for some time, but trade continues quiet with manufacturers. At the meeting of the Western Window Glass Jobbers' Association, held in Chicago last week, prices were reaffirmed. Local jobbers report business light and irregular, and this condition is supposed to exist in many sections of the country. In the uncertain condition of the market it is difficult to give exact prices, but the following quotations will serve as a guide in buying: Jobbers' quotations from jobbers' list October 1, 1903, Greater New York, 90 and 15 per cent. discount on all sizes, single and double strength. Outside of Greater New York, in the Eastern District, prices are not uniform, ranging from 90 and 5 for single and 90 and 10 per cent. discount for double, to 90 and 15 for single and 90 and 20 per cent. discount for double, according to location of territory. The Western Window Glass Jobbers' Association have reaffirmed prices.

Wood Split Pulleys.—Important manufacturers of Wood Split Pulleys have made a small advance in prices, the published quotation being raised from 65 and 10 to 65 and 5 per cent. discount.

Screws.—As recently stated in our columns, it has been suggested in some quarters that the end of the half year might see a moderate advance in the price of Screws. On this ground some attempt has been made to stimulate buying by the trade, although nearly all manufacturers are considerably behind their orders. No change, however, has occurred and it is reported that manufacturers are entirely satisfied to hold the market on its present level.

Linseed Oil.—Demand for delivery on contract orders has been fairly good, but new business is light. The Seed market is a little weak, but this has not resulted in lower prices for Oil. New York quotations are as follows, according to quantity: City Raw, 45 to 46 cents per gallon; Out of Town Raw, 44 to 45 cents per gallon. Boiled Oil is 1 cent a gallon over Raw.

Spirits Turpentine.—During the week local demand has been moderate on a somewhat weak market. New York quotations are as follows, according to quantity: Oil Barrels, 60½ to 61 cents; Machine Made Barrels, 61 to 61½ cents per gallon. According to press reports a movement is on foot in the South contemplating the restriction of the available market supply of Turpentine and thus securing higher prices. Instead of offering the entire supply of Turpentine for sale as it arrives, it is proposed to put half of it in tanks, which in time, it is hoped, will withdraw some 50,000 barrels from the market.

INCREASE IN MINIMUM CARLOAD WEIGHTS.

THE increase in minimum carload weights, which the railroads will put into effect August 1, should be borne in mind by buyers of carloads of Nails and Iron and other heavy goods. The object of this change is to secure the loading of cars to something near their carrying capacity, thus practically increasing the available supply of cars, as, when fully loaded, a smaller number of cars will be required to carry a given amount of freight. The minimum varies according to the commodities with which they are loaded. On carloads of Iron, Steel, Nails, Wire and other goods in the same classification, the minimum will be 36,000 lb., instead of 30,000 lb.

ON July 1 the agreement which had been in effect between the Tower & Lyon Company, New York City, and the Union Hardware Company, Torrington, Conn., terminated and a new agreement was entered upon. For a number of years the former company has been the New York representative of the Union Hardware Company, handling all of its business here. It is now deemed advisable for both parties for the Union Hardware Company to have its independent representative in New York. The office will still be with Tower & Lyon Company, but all correspondence will be answered and all sales cared for by the New York manager of the Union Hardware Company. Charles P. Gallager of the Tower & Lyon Company will represent the Union Hardware Company on the road as formerly, and there will continue to be the heartiest co-operation between the two interests.

Kensington Hardware & Lumber Company, Kensington, Minn., has been incorporated with a capital of $20,000, succeeding J. A. Wedum Company and A. H. Christenson & Co.

The store building and Hardware stock of Kennedy & Derby, Portland, Mich., was recently destroyed by fire.

System for the Retailer.

Seventh Article.

CHARGING GOODS.

BY JOHN A. MANSON, BURLINGTON, VT.

CHARGING goods—keeping tab on what is going out of the store—is one of the big problems of the retailer, and no clerk can be too much impressed with the importance of it. Many merchants and salesmen wait on their trade promptly and well—too well for the trade—

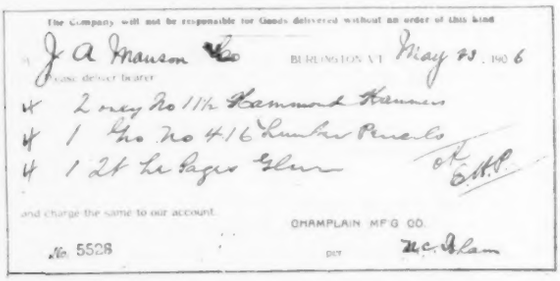

The Company will not be responsible for Goods delivered without an order of this kind
J A Manson & Co
BURLINGTON, VT.
May 23, 1906
Please deliver bearer
2 keg No 11 Hammond Hammers
1 Cho No 416 Lumber Pencils
1 24 lb Bags Glue
and charge the same to our account
CHAMPLAIN MFG CO.
No. 5528

Fig. 1.—Customer's Order Slip on Charge Transaction.

but they stop at the most important point. No charge is made, and the goods are out on wings. In talking with a merchant on this subject at one time I made the statement that there was

No Excuse for Failure to Charge

a delivery transaction, but that I wished I was always sure that every transient transaction appeared in the day's business. He suggested tagging every customer as soon as he entered the store, and checking him by some

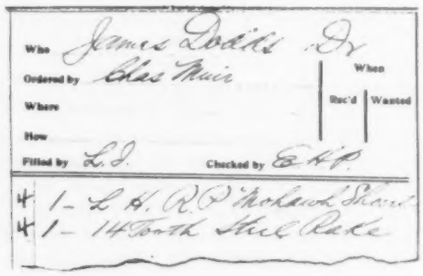


Fig. 2.—Merchant's Order Slip on Verbal Order.

method after he had been waited upon. I replied that this would be a hard proposition, and especially so for the merchant to whom I was talking. This gentleman was once approached by a salesman of a well known business

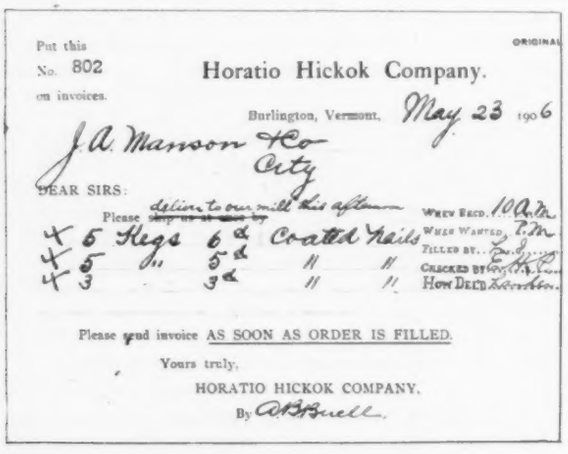


Fig. 3.—Delivery Order on Customer's Original Slip.

device and said to him, without getting much of an idea of the article offered, "Out of the question already, young man. I wouldn't have time to use it. Why, there are some days here when I am so busy that I don't have time to charge goods."

Merchants who are too busy to charge goods these days are rapidly passing down the line hand in hand with those who cannot say no to the lame and doubtful paying customer. The training of the Hardware merchant who begins at the bottom and works his way up is along the line of never dismissing a thing until it is done, and such a merchant is careful to see that his clerks follow

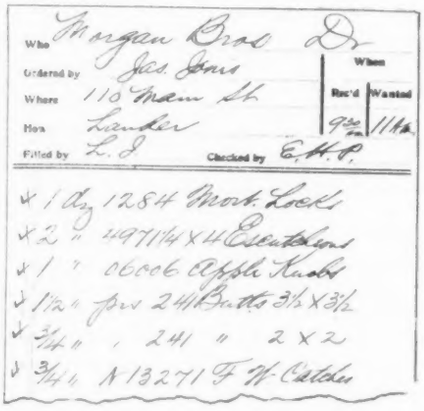

Who Morgan Bros Dr
Ordered by Jas Jones
Where 110 Main St
How Lander
Filled by L.J.
Checked by E.H.P.
When
Rec'd
Wanted
1 Dz 1284 Mort. Locks
2 " 4 9/16 x 11 Escutcheons
1 " 06006 Apple Knobs
1/2 " Jors 241 Butts 3½ x 3½
3/4 " " 241 " 2 x 2
3/4 " N 13271 F. W. Cattles

Fig. 4.—Merchant's Order Slip on Delivery Charge.

out the same principle—heart in hand into their work; business first, last and all the time if necessary.

Transient Charge Transactions.

Figs. 1 and 2 are examples of transit charge transactions, Fig. 1 showing the customer's original order slip, which is always retained, and Fig. 2 showing the merchant's order slip, which is filled out in the case of verbal or telephone orders. It will be observed that all

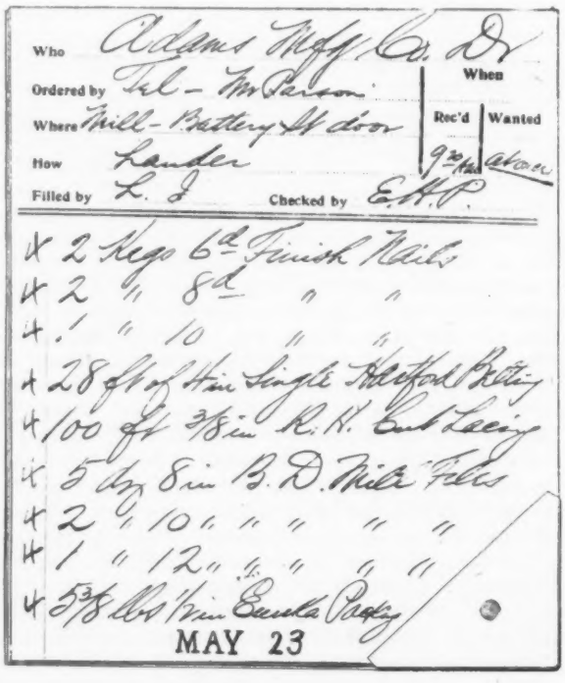

Who Adams Mfg. Co. Dr
Ordered by Tel - Mr Parson
Where Mill - Battery St door
How Lander
Filled by L. J.
Checked by E.H.P.
When
Rec'd
Wanted
9 3/4 Adams
2 Kegs 6d Finish Nails
2 " 8d " "
1 " 10 " "
28 ft of 4 in Single Thickness Belting
100 ft 3/8 in R.H. Cut Lacing
5 Dz 8 in B.D. Mill Files
2 " 10 " " " " "
1 " 12 " " " " "
5 3/8 lbs 1/2 in Eureka Packing
MAY 23

Fig. 5.—Group of One Day's Slips, Dated and Filed in Holder.

items on these orders are double checked. The first check is made by the clerk who waits on the customer and the second by the one in authority to O. K. orders, in this case represented by E. H. P. Figs. 3 and 4 represent

Delivery Charge Transactions;

that is, goods which are sent to the customer on orders received. When possible the customer's written order bearing the order number is used to work on, being stamped with a rubber stamp covering details, which is filled out as in Fig. 3. Fig. 4 shows the merchant's slip for a delivery charge written from a verbal order. This

does not need to be stamped, as it contains blanks for all the details required.

As already stated, the original order slips, examples of which have been shown, are preserved, each day's being arranged in alphabetical order and copied into the day book. The name of the person who ordered the goods and the customer's order number also go on the day book and later onto the customers' invoices. The slips are then bound together and filed away in the same

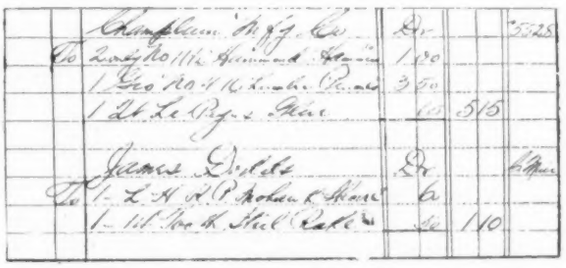


Fig. 6.—Portion of Day Book Page, Showing How Orders Are Priced and Customers' Numbers, &c., Are Recorded.

alphabetical order, each day's group being kept by itself for convenient reference and dated with a rubber stamp as shown in Fig. 5.

Readers have doubtless noticed that no prices appear on the order slips. The day's pricing is all done on the day book, the pricer doing this work right at his desk with the aid of the price book, referred to in the fourth article of this series. A portion of the day book page is reproduced in Fig. 6, showing how the customer's order number and the name of the person who ordered the goods are kept track of so that they can subsequently be entered on the invoices. This system of charging and billing is a great convenience to the customer in checking and also saves the Hardwareman unnecessary questions as to when and by whom goods were ordered.

TRADE ITEMS.

THE CREDITORS' COMMITTEE of the Consolidated Mfg. Company, Toledo, Ohio, has issued a statement in which it reports that upon an examination into the affairs of the company it has found that the reciever, through his manager, is conducting the business in a careful, systematic and businesslike manner. An inventory will be taken about August 1, which will be audited by a public accountant and will then be submitted to the creditors. Having in view the necessity of making early contracts for materials for next year, the committee recommends to creditors and the court that the receiver be authorized to continue the business one year from September 1.

F. W. MARTIN, on June 15, severed his connection with the Morton-Simmons Hardware Company, Wichita, Kan., of which company he has been secretary and in charge of the sales department since its organization, January 1, 1906, as successor to Hockaday Hardware Company. Previous to that time Mr. Martin had been connected for a period of seven years with the Hockaday Hardware Company as assistant manager and buyer, coming to Wichita from El Reno, Okla., where he had been for eight years with Ed. Hockaday & Co. Mr. Martin, whose address during that time will be 1303 East First street, Wichita, will rest up for two or three months before reengaging in business.

THE LATSHAW PRESSED STEEL & PULLEY COMPANY, Pittsburgh, has appointed the Hawley Hardware Company, Bridgeport, Conn., as its agent for the sale of the Latshaw Steel Split Pulleys in southwestern Connecticut.

THE COLUMBIAN CUTLERY COMPANY has succeeded the Wilkinson Shear & Cutlery Company and Wilkinson Shear Company. The Columbian Company will continue the manufacture of Wilcut Butcher and Kitchen Knives, Sheep Shears, Grass Shears and kindred Cutlery specialties as formerly made by the Wilkinson concerns. The officers of the new company are Cyrus G. Derr, president; Philip A. Bushong, secretary-treasurer, and Charles S. Prizer, general manager.

French Cutlery and Its Manufacture.

BY A PARISIAN CORRESPONDENT.

"A CURIOUS old custom, dating from the days of the diligences," said my companion.

The Paris-Bordeaux train had just stopped at Chatellerault station, and three or four female Cutlery hawkers paced the platform, offering their wares—Pen Knives, Pocket Knives and similar small goods—to our fellow travelers in the cars.

A French Sheffield.

"Local industry?" I inquired. "So this is the French Sheffield?"

"I'm afraid the articles these worthy women are forcing upon us were made a long way from here," rejoined my traveling companion. "Chatellerault, or rather the neighboring villages where its two or three factories exist, now turns out little but Table Cutlery and Razors, and as the workmen only number some 500, it is a very modest 'Sheffield.' In days gone by, before the establishment of the Government Small Arms factory drew away the bulk of the workmen (and when the various trunk roads that cross here made the town very central and important) all kinds of Cutlery was made. It was the local custom for the Cutlers' wives to walk miles out of town with their heavy satchels to meet the coaches. They hung on the steps and offered their wares, and, as they had also the entree of all the best inns of the town, the traveler that left Chatellerault without some specimen of the local industry was a man of unusually firm character or limited means. Curiously enough, the practice of pushing sales has survived the actual manufacture of many articles. But nowadays they have only 10 minutes or so per train."

As we moved off I suggested that a visit to the factories might be interesting.

"Not specially so," I was informed. "There are just a couple of big works, each employing some 200 men, and some smaller places. All are driven by water power and are located in or around the villages of Naintré, Dominę, Chezelles and Cenon. The industry having practically disappeared about 50 years ago, and having been reinstalled on modern mechanical lines, the curious features which characterize the Haute Marne and Puy-de-Dôme Cutlery districts are lacking."

Penalty of Inaccessibility.

The description he gave me of the very original conditions under which the bulk of French Cutlery is produced aroused my curiosity to make further investigations. The districts, however, are distant from Paris and away from the main lines of traffic, which probably accounts for the fact of their being seldom visited or described by foreigners.

Location of the French Metal District.

To reach Thiers, Puy-de-Dôme Department, 18,000 inhabitants, is an all-day or all-night journey, though the distance from Paris is but 250 miles. Leaving the main line at Clermont-Ferrand, about 30 miles of the branch track which runs over the mountains to St. Etienne (the French Pittsburgh), brings the traveler to a little depôt perched on a viaduct, overlooking one of the most curious of France's industrial centers.

The "Black Town."

Thiers, the "Black Town" of George Sands' novel, is huddled in picturesque hilly confusion on the banks of a narrow but rapid stream, the Durolle. This little river drives the grindstones, &c., of a hundred ancient grimy houses which line its two sides, cutlery works which with the other establishments throughout the town, employ 10,000 men. This is indeed the "French Sheffield" in its black and busy industry; but, unlike the English steelopolis, Thiers founds its reputation chiefly on cheap and often inferior articles. A goodly portion of the cutlery for export is here manufactured, the keen edged

"Brazilian," the "saladero," for South American slaughtering houses—a knife from 6 in. to 1 ft. long, selling at 70 cents to $2 per doz.—the "machete," with which a path is hewn through tropical forests; the curved and pointed "Toledo blade," popular throughout Spain, alike for peaceful meal or bloody fray; cheap knives and razors for Oriental bazaars; the sailor's jack knife and the gardener's pruning knife; shears and scissors, corkscrews and tweezers—these are only a few of the hundreds of articles made for abroad.

Amount of Exports.

It is difficult to ascertain the exact figure of exports as little business is done direct, the trade being carried on through firms at Paris, Marseilles, &c., but the Levant, the South American Republics and France's European neighbors, Spain, Switzerland, &c., are the chief buyers, and the yearly total may be about $600,000. There are few very large factories at Thiers, and steam power is the exception rather than the rule. The proprietors of premises along the Durolle utilize as much of their water power as they require and hire out the rest to the 2000 "Grinders and Polishers," the most powerful and numerous of the various cutlery corporations of the town. These men pay so much per week for their bench and are an independent and rather thriftless class of men who keep up some of the worst traditions of the trade. Their practice of lying flat on an inclined plank, instead of sitting at their grindstone as elsewhere, has been handed down from father to son for untold generations, and is the despair of modern medical men. Up to the present every effort made to bring about a change has been ineffectual, but it seems possible that the rising generation will be more amenable to reason.

Table Cutlery.

The production of table cutlery at Thiers is now some 600 gross per week, having very largely increased, probably tripled, within the last decade or so. The entire cutlery output of Thiers and the district is 2500 tons per annum. Besides the town workmen, a large proportion of the population of the surrounding villages come in weekly to fetch articles which are finished at home at very low prices, mostly in small workshops employing from 2 to 12 hands. Some mechanical processes are now introduced in Thiers factories, the emery wheel replacing the file, while handles are entirely made by machinery. But the characteristics of the Thiers cutlery trade are still as a rule undesirable conditions, rudimentary and old-fashioned practices, extreme division of labor, and comparative lack of modern machinery and more especially of motor force.

Low Cost of Living.

The low cost of living—men in town factories are content to make $6 a week, and in the country the peasant raises most of his own food and puts in his spare hours at cutlery work at half the above rates—alone enables France to compete with other nations.

For the home trade most of the cheaper class of Cutlery is made at Thiers, Pocket and Penknives, Kitchen and Butchers' Cutlery, Gardening Tools, &c., as well as the Table Cutlery already mentioned, and a great number of articles sold by "cheap Jacks" at fairs, in bazaars, &c. The better class articles usually come from the Langres (Haute Marne) District.

Disappearance of French Cutlers.

Langres is a town of 9000 inhabitants on one of the main lines from Paris to Switzerland. Here, as at Chatellerault, the Cutlery trade once located in the town itself has migrated to the adjacent villages in search of cheap (water) motor power, and is now to be found in and around Nogent-en-Bassigny, 3500 inhabitants. There are probably not over 4500 men engaged in the "Langres" Cutlery trade, but they stand, so far as France is concerned, at the head of their profession. A very large number now work in modern factories, but the old-fashioned home worker of the Nogent District is the pride of the French Cutlery industry, and many look upon his steadily diminishing numbers with some dismay. The extreme division of labor characteristic of the Thiers factories is not the rule in these parts, and in many a humble workshop the Penknife or other highly finished article will be made from start to finish by a real craftsman. The blade and springs hand forged, the whole filed, fitted and mounted. These Knives, made by one man or in one small workshop, are reputed inimitable. A steady, hard-working man, whose pride is in quality, not quantity.

Primitive, Old Fashioned Method.

He will weekly go to the nearest center to buy his material and sell his output; and here, of course, he suffers. His well wishers, who would fain see him hold his own against modern machine made goods, counsel the formation of village workshops, where the weekly purchase of material could be made on a larger scale and the worker spared to some extent the hard bargain which the buyer will always drive when dealing with an isolated individual who must necessarily dispose of his work immediately and at any price it will fetch.

Total Output.

The production of the district is estimated at $1,000,000 per annum, of which about two-thirds is exported to Spain, Italy, Belgium, Switzerland, Holland, Germany, South America and the French colonies. Most of this is what is known in the trade here as "fine" and "one-half fine," as distinguished from the "common" goods of Thiers.

Source of Much Fine Cutlery.

The highly finished Penknife and Pocket Knife, and above all, Scissors of every kind, are here produced in perfection, from tiny Embroidery Scissors to Tailors' Shears—special models for the silk trade, the linen trade, the hat trade, the shoe trade—all are equally remarkable. Pruning Shears of various local models—the "Angers," "Bordeaux," "Angen" and "Montpellier" shapes—are another specialty. Knives for carters, gardeners, shepherds, butchers, saddlers, shoemakers, pork butchers, &c., are largely made in the best style. Table Knife Blades are turned out in great quantities, but mostly sent to Paris to be mounted. In fact, here, as at Thiers, much of the Cutlery is made to order for Parisian firms and bears Paris marks accordingly.

Moderate Wages.

Wages are moderate; the best men do not make $1.50 per day, and some earn as little as 60 or 80 cents; but the cottager's wants are few, and he is usually comparatively comfortable and contented, living on his "potée"—cabbage, potatoes and bacon—on week days, with a pot-au-feu or chicken on Sundays and fêtes, and turning out work, which in some lines, Scissors, for example, has never been beaten, and leading French Cutlers declare seldom equaled.

A Larger Market Possible.

Generally speaking Thiers Scissors are apt to be badly ground, and the Razors made there are inferior to those produced at Nogent, Chatellerault or Sens. French Table Cutlery is often of superior make and finish, and were it as well known and diligently advertised as Sheffield Ware might enjoy an equal reputation, once the foreign buyer became accustomed to French patterns, which slightly differ from English.

It is also an open question whether the best French Razors would not bear comparison with anything turned out at Sheffield, Solingen or Eskilstuna. In fact, the French Cutlery output is remarkable, both in quantity and quality, a fact not always sufficiently recognized in certain foreign countries. Certain defects naturally exist, the most apparent being in Pocket Cutlery—some of the Thiers Knives of this class shut badly and have weak springs. The study of German models might here be useful to local makers.

Paris finishes, ornaments and exports Cutlery, but the actual manufacture of the capital is small, most articles bearing the Parisian mark being made at Nogent or Thiers.

PRICE-LISTS, CIRCULARS, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

McKENNA BROS. BRASS COMPANY, Pittsburgh, Pa.: Illustrated catalogue devoted to Brass, Nickel and Oxidized Railings, Portable and Stationary Electric Light Desk Stands, Electric Wall and Desk Fixtures with sliding lights, Brass and Electro Plated Grilles, Brass Hand Elevators, Cuspidors, &c.

BUTLER BROTHERS, Chicago: Midsummer number of "Our Drummer," their illustrated catalogue No. 618, containing an immense variety of goods, including an extensive line of Hardware. The house confines its transactions to merchants exclusively.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y.: Bulletin No. 4507, for June, devoted to Electric Flatirons.

THE STANDARD WIRE COMPANY, New Castle, Pa.: Bulletin illustrating Folding Steel Wire Mats and Matting, Rubbish Burners, Letter Trays, Waste Paper Baskets, Electric Lamp guards, Wire Jumping Ropes, Carpet Beaters, Wire Kitchen Utensils, Card Holders, Display Stands, Filter Screens, Folding Display Tables, Folding Nursery Fenders, Wickets, Tree Guards, &c.

CEDAR RAPIDS PUMP COMPANY, Cedar Rapids, Iowa: Catalogue No. 10, relating to Wood and Iron Pumps, Cylinders, Soil Pipe and Fittings, Tank Heaters, Stock and Storage Tanks, &c., all of which the company manufactures. It also jobs Plumbing and Heating Supplies, Pipe Fittings, Well Casing, Windmills, Well and Tubular Supplies, Engine Fittings, Hose, Belting, Packing, Tools, &c.

CHARLES MILLAR & SON COMPANY, Utica, N. Y.: Catalogue H, 656 pages, relating to supplies of every description for Plumbers, Water Works, Steam and Gas Fitters, Contractors, Engineers and Mill Owners, Steam and Hot Water Radiators and Boilers, Hot Air Furnaces, &c.

JAMES L. TAYLOR MFG. COMPANY, Bloomfield, N. J.: Catalogue relating to the Taylor Quick Adjusting, Self Locking, High Grade Screw Clamps.

PECK-HAMRE MFG. COMPANY, Berlin, Wis.: Catalogue E, relating to Rural Mail Boxes, Sliding Barn Door Latches, Swing Door and Gate Latches, Store Trucks, Christmas Tree Holders, &c.

MOLINE PUMP COMPANY, Moline, Ill.: Catalogue and circulars devoted to Gasoline Engines, Pump Jacks, Wood Saws with Sliding Tables, Feed Grinders, Pocket Ammeters, Children's Hand Cars, Platform Scales, &c.

GARLOCK PACKING COMPANY, Palmyra, N. Y.: Catalogue illustrating and describing Steam, Hot Water, Hydraulic, Air, Metal and Sheet Packings; Gaskets, Hose, Molded Goods, Pump Valves, Contractors' and Mill Supplies, &c.

NEW DEPARTURE MFG. COMPANY.

BEGINNING August 1, the product of the New Departure Mfg. Company will be sold direct from the home office and salesrooms, Bristol, Conn. The salesmen of the company will travel from Bristol and all orders will be received at and invoiced from the factory. John H. Graham & Co., New York, who have successfully marketed New Departure products for many years will still look after New York City and portions of the export trade. The salesrooms now about completed have been modeled on modern lines. DeWitt Page, secretary of the company, and identified with it in an official capacity since its establishment, will be at the head of the sales department.

Extensions to the factory in process of construction will shortly bring the number of hands employed to 1000 or more. The "automatic department" has been operated full handed and overtime for months past in order to meet a growing demand for the New Departure products, notably the Incomparable New Departure Coaster Brakes, for Bicycles and Motor Cycles. To keep pace with the revival of Bicycle riding in America, new machinery and additional floor space is being provided. The company has just gotten out a new Motor Cycle Hub containing important improvements. The manufacture of Steel Balls and Automobile Bearings will become an important industry with the company upon completion of plant and machinery now building.

The company has recently purchased the plant and business of the Liberty Bell Company, and will continue the manufacture of the Liberty Chime Bells, in addition to the extensive New Departure line. The Liberty Trolley Harps, a new and improved device, rapidly coming into favor with the street railway men, will also be manufactured.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM W. K. MORISON & CO., Minneapolis, Minn., whose extensive stock has been badly damaged by fire. The company will value copies of catalogues and price-lists from manufacturers with information as to quotations.

FROM COCHRAN & BRISTOL, Mitchell, Neb., carrying a retail stock of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods and Furniture. Mr. Bristol, of this firm, has recently purchased the entire stock of the Blair Hardware Company, Blair, Neb., and has moved it to Mitchell.

FROM W. L. ROSE, who has purchased the store of Wm. Wenk in Creston, Neb. Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Furniture are handled.

FROM PINE HILL SUPPLY HOUSE, Pine Hill, Buffalo, N. Y.

FROM SNOW-TULLIS HARDWARE COMPANY, Montgomery, Ala., which is about to add a retail showroom for the sale of General Hardware and Sporting and House Furnishing Goods. The company is especially desirous of receiving catalogues from makers of novelties in these lines.

FROM FULLER HARDWARE COMPANY, Fitchburg, Mass., which will commence business August 1, under the proprietorship of W. T. Gavin and W. A. Fuller of the Gavin Hardware Company, Leominster, Mass.

FROM HARRY EASTON, Alexandria Bay, N. Y., who has recently embarked in the plumbing business.

FROM H. GOLDBLATT TOOL COMPANY, successor to H. Goldblatt Hardware Company, Kansas City, Mo., which has discontinued the sale of Hardware and will deal exclusively in tools, including Plasterers', Masons' and Cement Tools.

FROM L. T. DICKSON HARDWARE COMPANY, Opelika, Ala., which is being organized with a capital of $5000 to begin business September 1.

THE EDWARD PAYSON MFG. COMPANY, manufacturing Hardware specialties, is now establishing a modern plant in Traverse City, Mich., which is 144 miles north of Grand Rapids, having left Chicago in order to get away from interminable labor troubles there. When it is completed there will be an available floor space of 18,000 sq. ft., and all machines will be electrically driven. Traverse City has excellent shipping facilities, both by lake and rail, and is also in close proximity to the raw material, especially pig iron.

Hardware Window Display

Thirteenth Article.

SOME METHODS OF SHOWING LAWN MOWERS.

A NUMBER of suggestions regarding the display of Lawn Mowers have been given in previous articles of this series. Few merchants attempt to make extensive window displays of Mowers, rather contenting themselves with placing one or two in the window on a background of green crepe paper, cut to represent grass, or green burlap, such as was described in a recent issue. Other merchants show their line of Mowers on the sidewalk, or on a slightly elevated stand in front of the store.

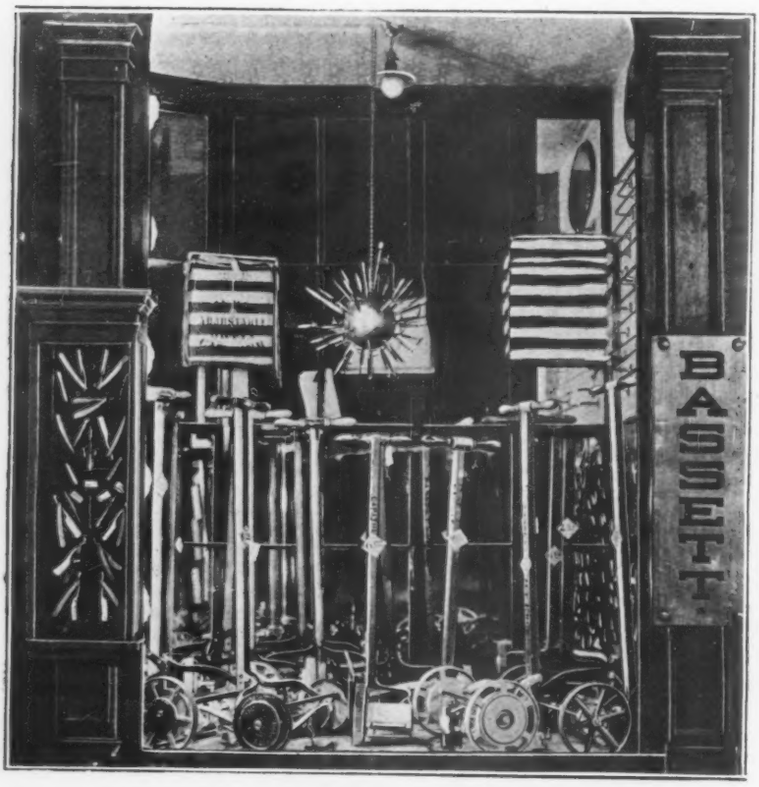


Fig. 41.—A Lot of Mowers in a Small Window.

Perhaps it might not occur to the average merchant that a window of ordinary size could be made to contain enough machines to form an imposing display indicating an extensive line. That this can be done, however, with splendid results is shown in Fig. 41, which is a photograph of a Lawn Mower window recently installed by the John E. Bassett & Co., New Haven, Conn. In this window there are 10 or a dozen Mowers of different sizes and designs, painted in a variety of bright colors, forming an exceedingly effective display. Each handle bears a card, on which the price of the machine is painted, while a couple of sample Grass Catchers occupy space in the upper part of the window.

An Imposing Display.

The feature of this display, which will doubtless be of greatest interest to our readers, is the ingenuity with which the handles of the Mowers are arranged in a vertical position, thus permitting so many machines to be grouped in the small floor of the window. The trick is done by simply drawing the lower of the two Bolts, which hold the wood handle in the frame of the machine, then straightening up the handle and tightening the other Bolt to hold it stiff, the position of the handle and Bolts being clearly indicated in Fig. 42.

Vertical Handles.

Other features of interest regarding this window may be noted in passing. One is the vertical showcase shown at the left of the picture, which is built on to the framework of the building on the right of the entrance to the store. A similar case occupies a corresponding position on the left of the entrance, beyond which there is another window of the same size and shape as the one illustrated. These vertical cases are used for permanent displays of Pocket Cutlery, Razors, Scissors, &c., and it may well be believed that they are studied with interest by numerous passers-by and offer a favorable suggestion of the stock carried inside.

Front Showcases.

Another feature of this window which should be studied with interest is the glass frame which shuts it off from the store. The upper sashes of this frame are ordinary window glass, but the lower sashes, reaching up just about to the grips of the mower handles in the cut, are mirrors, which not only add greatly to the brilliancy of the light, both by day and night, but considerably increase the apparent size of the windows and multiply by reflection the number of goods therein contained. For instance in the case of the present display the window looks to be several feet deeper than it is, and seems to

Use of Mirrors.

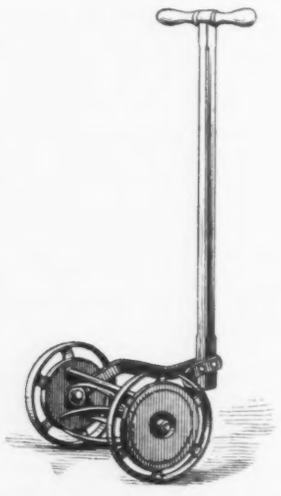


Fig. 42.—Method of Fixing Handle in Vertical Position.

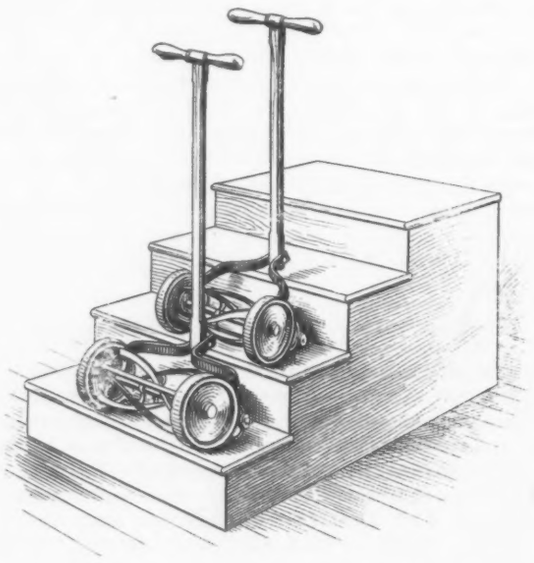


Fig. 43.—Stepped Stand for Accommodating Lawn Mowers.

contain fully twice as many machines as is actually the case.

Reference has been made to the light in the window at night which suggests the interesting fact that the John E. Bassett & Co. keeps all its window lighted by electricity until a late hour in the evening when the current is turned off by arrangement with a police officer on the beat, for whose use there is a convenient button on the outside of the store. The company makes a great deal of its windows, changing its displays every week and spending much time, study and money in getting results that will be distinctive and command popular attention.

Evening Illumination.

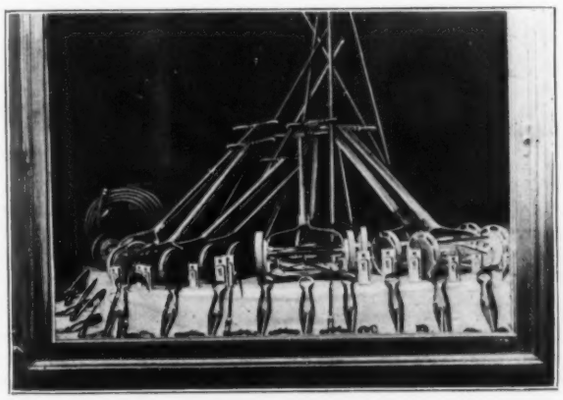


Fig. 44.—Lawn Mower Window of Hotchkiss & Templeton.

Another method of displaying a line of Lawn Mowers with handles removed or fixed in a vertical position, as shown in Fig. 42, is indicated in Fig. 43. This idea involves the erection of a stepped stand about 20 in. wide with steps about 10 in. high. This brings the mechanism of each machine up above the one in front of it, so that no one conceals another and all may be seen equally well. The stand shown in the cut has four steps, but of course as many as six could be used without bringing the machines too high for favorable examination. The natural arrangement would be to show a different size or design of Mower on each step, grading them either with the largest at the bottom and the smallest at the top or *vice versa*. Such a stand is especially effective if covered with grass green burlap or green paper, as suggested above, for window floors.

Stepped Stand.

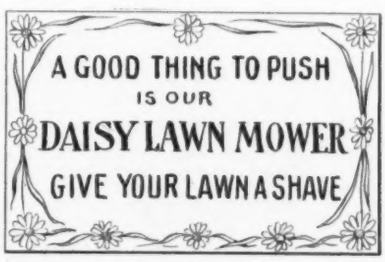


Fig. 45.—A Daisy Lawn Mower Sign.

In Fig. 44 we reproduce an excellent window display of Mowers and Lawn and Garden Tools occupying the spacious show window of Hotchkiss & Templeton. Waterbury, Conn. This window is so large that it will contain a number of machines with their handles in the natural position, and the clever idea of the window dresser is to arrange them so that the handles all converge in the center of the window, forming a sort of stack, to which are added Wood and Wire Rakes, Hoes, Spades, &c. At intervals on the raised stand occupied by the machines are bottles of Lubricating Oil, while coils of Hose occupy the background.

A Stack of Handles.

Around the edge of the platform in the front and on the left hand side of the window, which is toward the entrance of the store, Sickles, Grass Shears, Hose Nozzles, Couplings, &c., are neatly arranged. The Shears lean against the platform with their points down, while the Sickles make little arches, with their points stuck into the platform and their handles resting on the floor below. Pairs of Nozzles form shining brass angles between the Sickles and the Shears. The whole display was an exceedingly attractive one, which may be studied with profit by any merchant who has ample space at his disposal.

Sickles Form Arches.

We reproduce in Fig. 45 an attractive sign which a merchant used this spring in connection with a Lawn Mower display. A pat sign is always an addition to a good window, but it must be well lettered and must have an interesting point of its own. For instance, a sign which merely read "Lawn Mowers" would be flat enough in connection with either of the above displays, but such a sign as this affords an agreeable touch of pleasantry and might even attract attention when the goods themselves would otherwise have gone unnoticed.

A Pat Sign.

SIMONDS MFG. COMPANY AT JAMESTOWN.

A FEATURE of the exhibit of the Simonds Mfg. Company, Fitchburgh, Mass., at the Jamestown Exposition, is the educational part. The Simonds people show the crucibles in the different stages of melting, the ingot after it has been poured, then the different stages of rolling, until at the end a finished Saw appears. The display booth is built in Colonial style, with white enameled woodwork. It measures 19 ft. deep and 32 ft. long. Signs across the top of the booth refer to the company's branch houses, with pictures of the factories at Fitchburg, Mass.; Chicago, Ill., and Montreal, Que. The company invites customers, friends and particularly members of training schools, to visit the exhibit and note the various lines of manufacture, the different kinds of Saws, Knives, Files, Hack Saws and Frames, &c. Visitors are further invited to make their headquarters at the Simonds space, desk and chairs being provided for their use.

THE OKLAHOMA CONVENTION.

AN elaborate programme has been prepared for the annual convention of the Oklahoma Retail Hardware & Implement Dealers' Association, which will be held at Oklahoma City on the 9th, 10 and 11th inst. Provision has been made for a number of interesting papers and discussions on practical topics. Among these will be the general management of the store, window dressing, mutual insurance, catalogue house competition, credits, profit protection and relations between jobbers and retailers. The matter of the formation of a central collection agency will also come up for deliberation, while the question box will doubtless furnish other live subjects worthy of attention. A large and representative gathering of Hardware interests seems to be assured.

JAMES COCHRAN, vice-president and director of the Lalance & Grosjean Mfg. Company, New York, was recently the recipient of an exceedingly handsome silver loving cup, the gift of the company's Board of Directors. In consequence of impaired health and a desire to get away from business cares more than has been possible in 38 years of faithful and close application to business, Mr. Cochran resigned the office of vice-president, to take effect July 1, but still remains a director of the company. The cup was a testimonial of the great regard and esteem in which he is held by his associates on the board. Mr. Cochran has arranged to spend the summer and possibly some of the fall in Nova Scotia.

THE GEORGE Q. HILL COMPANY, Boston, Mass., has opened a Western office at 905 Plymouth Building, Chicago, Ill. It will be under the management of William Pike.

Important Developments in the Parcels Post Campaign.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., July 2, 1907.

TWO important developments in the campaign of the parcels post promoters have recently occurred that should have the very careful attention not only of Hardware retailers, but of the jobbers and manufacturers as well. The support which the parcels post proposition has recently received in certain journalistic quarters has given a decided impetus to the movement, but is fully explained by the developments referred to.

One Cent Per Pound for All Classes of Postal Matter.

The Postal Progress League, which, although working spasmodically, has constituted the head and front of the parcels post crusade for the past half dozen years, has adopted a new policy, conceived with no little ingenuity, to enlist the aid of publishers of all classes of periodicals and especially of so-called house organs, without regard to the particular line of trade in which they may be interested. These publishers, it is well known, have been much disturbed by the agitation in the Post Office Department and in Congress of a plan designed to increase the rate of postage on printed matter. The subject of the proper classification for postage of all newspapers and periodicals is now in the hands of a commission.

An Appeal to Selfish Interest.

At this psychological moment, which has undoubtedly been well chosen, an appeal has been promulgated to all the publishers of the country to unite in a movement to retain the publisher's rate of 1 cent per pound by urging upon Congress the consolidation of all postal matter into one great class at the uniform rate of 1 cent for each 16 ounces or less. Such a plan would enable the publisher to keep his present low rate; it would more than realize the desires of those who have been working for the consolidation of third and fourth class mail matter at the rate of 8 cents per pound, and finally it would bestow upon the general public the great boon of penny postage. It would be difficult to devise a more comprehensive or specious scheme, appealing at once to the selfish interests of many classes. In this appeal it is declared that for nearly 10 years "the evil in the cent-a-pound publishers' post was in its limitation rather than in its extent, and that with a reasonable use of our transport machinery a common cent-a-pound rate would be practicable on all classes of mail matter." Up to the present, however, the time has not come, it is stated, to urge this propaganda, but it is now put forth in part as follows:

The Argument.

Our book publishers now send their manufactures—printed books—around the world in 2-oz. parcels for 1 cent, 1-lb. parcels for 8 cents. That the consolidation of the first, third and fourth classes of mail matter, letters, books, general merchandise, matter written or unwritten, sealed or unsealed in parcels, say up to 11 lb. at the book publishers' rate, 1 cent for each 2 oz., 8 cents a pound, would be a great public benefit, requires no argument. That such a service could be made to pay its way is, we think, clearly evident. The post office would get an immense local business that now goes to private transport agencies. England has long enjoyed a letter rate of 2 cents for the first 4 oz., 1 cent for each additional 2 oz., and the business has proved very profitable.

But while we are about it, why not consolidate all classes of mail matter at the common rate of 1 cent a pound now enjoyed by newspaper and periodical publishers and by news agents? Neither the public nor the publishers can afford to have the publishers' rate increased. It costs practically the same to handle one kind of mail matter as another. What is good for the publishers is good for us. It is quite as important for us to get the advertised goods as to get the advertisements, and newspapers and magazines are largely made up of advertisements. Bread, meat, clothes and other manufactured goods are quite as important to us as our newspapers and our magazines, and with a reasonable use of our transport machinery, machinery about to be run by electricity at a half or third the cost of steam, there is every reason to believe that a common cent-a-pound rate on all mail matter could be made to pay the cost of the service rendered.

Glaring Fallacies.

It does not require any great perspicacity to analyze the Postal Progress League's argument and expose its most glaring fallacies. Its declaration that the British letter rate of 2 cents for the first 4 oz. "has proven very profitable" is notoriously false, and for the reason that the bookkeeping methods of the British postal system are such that it has been impossible to determine whether any particular rate is profitable or unprofitable. This fact has frequently been developed in connection with efforts made to ascertain the cost of operating the parcels post system in England. The statement that "it costs practically the same to handle one kind of mail matter as another" is ridiculously false. A comparison of the cost of transporting and distributing 100 lb. of half-ounce letters, for example, with the cost of sending 100 lb. of periodicals in bulk from a publisher to a news agent at once exposes the absurdity of this contention. It is obvious, however, that Mr. Cowles makes his appeal to the self-interest rather than the unbiased judgment of the publishers and in some quarters his arguments will have to be reckoned with.

The Second Development

referred to is a movement in which are interested a considerable number of drug manufacturers who sell direct to the retail trade and whose policy it is to entirely eliminate the jobber. A representative of this interest, F. F. Ingram, a manufacturing druggist of Detroit, has spent several days in Washington during the past fortnight collecting data for use at the coming session of Congress. Mr. Ingram says that he has been making a close study of the domestic parcels post systems abroad and especially that of Germany, and has reached the conclusion that the introduction of the institution in the United States would be of great advantage to the small merchant and would enable him not only to compete with the giant mail order houses, but ultimately to drive them out of business. This is a surprising statement and Mr. Ingram concedes that its realization would involve important changes in the business methods now pursued by retailers.

How It Works in Germany.

He concedes that the mail order houses are now making great progress at the expense of the small merchant and that the consumer is more than ever ready to become the victim of the flamboyant catalogue. Continuing, Mr. Ingram says:

But how does it work in Germany? Just the other way. There the department or mail order house has not made any headway in the direction of putting the local merchant out of business. Why? Because in that country the local merchant has the benefit of the parcels post, enabling him to get quick action on all sorts of goods from his wholesalers, and the result is that in that country he is the one who handles the catalogue.

And he is not confined to one, either. Go into any country store in Germany and you will find a dozen or more catalogues, covering every variety of goods made. The prices are as low as the customer could possibly get from any mail order house. What does the customer do? Order from some one in the city direct? Not much. He says to himself, "Here is a case where if I order direct and anything goes wrong with the order, I will be the loser, or, at least, I may be. If I order from my friend, the local dealer, and the money is lost, or anything else happens to the order, he will be the loser. Therefore I will order from the local man."

This is not guesswork. We know it is the way it works in Germany. In Germany the local dealer gets the 5 per cent. profit offered by the mail order house, and he does the business and is prosperous. Of course he keeps a stock of goods, but it is no larger than the stock in a similar store here, perhaps not so large. But he is in touch with his wholesalers, who will see that he is protected and that no mail order house can undersell him. He can telephone at any time to the wholesaler for anything he wants, and it is sent by the first means at hand. If it is a small article the parcels post takes it. If it weighs too much for the mails, it has to go by other means, the same as in the United States.

But it is in the popularity of his store through his means of satisfying his customers that he makes his money, and in the infinite variety of small articles he can have sent to anybody at short notice. He has several wholesalers behind him, of course. Thus, if one cannot send what is wanted another can, and he is never at a loss. He can meet the demands the same as if his store was as big and well equipped as any of the largest department stores in the city.

Magnitude of the Task Appreciated.

The manufacturers who are pushing the parcels post project on this basis state that they realize the magnitude of the task they have undertaken and that they are not at all certain that they will be able to carry it through at the coming session of Congress. They say that "there are many converts to be made in this country," and they may not be able to make them in time to get action next winter. They intend to keep at work, however, declaring that they do not doubt that "if we had the parcels post as liberally as they have it in Germany we would have the same prosperity among the small country merchants and the same convenience for everybody.

W. L. C.

RESALE PRICES.

THE following paper on the subject of resale prices was prepared for presentation at the recent annual convention of the National Retail Hardware Association at Boston by O. A. Keyser, manager of sales and advertising for the Dover Mfg. Company, Canal Dover, Ohio. It was not, however, read at the meeting owing to lack of time. We take pleasure in laying it before the trade in view of its discussion of an important subject:

The greatest problem which confronts the manufacturer is the problem of distribution. You gentlemen are also concerned with the problem of distribution, since you are primarily distributers—not producers or consumers.

I heard you discuss the subject of publicity advertising yesterday. While the solution of this subject eventually rests with the producer, it is only natural that you should discuss it. Discussion is a good thing when it actually results in edification. I am sorry to note that some gentlemen who talked rather heatedly on the subject of advertising yesterday displayed a lack of familiarity with the subject.

I may be mistaken, but I fear that some of you hold erroneous views on the subject of advertising. Personally I feel that the censorship of editorial comment for the benefit of advertisers is wrong. When the subject of conducting an antisubstitution campaign was being agitated by several advertising men of prominence, my opinion was solicited. I said that I personally was opposed to the antisubstitution campaign. I do not believe in substitution, but I repudiate editorial censure of the retail dealers as a class.

Distribution Difficulties.

In seeking a means of distribution, the manufacturer is confronted with two alternatives: He may go direct to the consumer, or he may follow the jobber and retailer route. Just in passing I happen to know that some manufacturers have found the former to be the cheaper road to travel.

It is a scientific fact that distribution always entails more or less resistance. I regret to state that the distributer of Hardware offers considerable resistance when the manufacturer runs up against him. Some of this resistance is caused by ignorance and apathy, and some by physical conditions that always will exist.

The Retailer's Function.

Your sole function in the economics of society is to satisfy the needs of the consumer by supplying utilities furnished by the producer. You are ordained to serve humanity—and humanity will be served. The order of things cannot be frustrated. If the object of your association is to withhold supply from demand, your prerogative as distributers is jeopardized. I know, however, that your purpose is constructive, not destructive. You are striving, by a consensus of opinion, to further the welfare of humanity. You are not conspiring against the decrees of nature, but are co-operating with the dispensations of Providence.

Lubricating Distribution Channels.

The subject of my discussion ramifies from the question of distribution. It has been agitated a great deal by manufacturers who desire to grease the channel of distribution. It is an endeavor to overcome a degree of resistance on the part of the retail distributer.

When one gazes into a mirror he gains a general concept of the physical properties of the *genus homo*. Likewise, when one uses the mirror of introspection he gains a general concept of the thoughts, motives and feelings of humanity. I am not engaged in the retail Hardware business, but by introspection, supplemented by observation, I can imagine myself a retail Hardware dealer and contemplate the subject of distribution from his standpoint.

The retail Hardware dealer is an awfully good fellow when you meet him at such a convention as this. However, even the good nature of the average dealer will not induce him to distribute goods as an accommodation to any one.

Money the Issue.

Some men may be in business for fun, which is all right if they receive ample satisfaction. For my part, I could never quite appreciate the humorous side of conducting a business. I am like the Hoosier school boy: I'd rather go fishing all day than turn a Grindstone for 15 minutes.

I take it that the majority of retail Hardware dealers engage in business for a livelihood—and a little more. At least, the manufacturer is in business for that purpose. After all, the logical issue of commercial enterprise is money. Other vocations offer other issues.

Good Profits Preferred.

By imagining myself a retail Hardware dealer I reach the conclusion that I would feel especially interested in the sale of those commodities which bear a good profit. As a manufacturer, therefore, I reach the conclusion that I should assure a profit to the dealer on the goods of my manufacture. If my deductions are correct this assured profit will place a premium on my goods in the dealer's estimation, and cause him to give them preference in the act of distribution. In other words, the manufacturer is desirous of building up the largest possible sale for his product, and, if an assured profit for the dealer will help to accomplish this end, a method of profit assurance must be devised.

Price Maintenance.

This logical process has led certain manufacturers to fix and maintain minimum resale prices which will assure a profit for the retail dealer.

In a sense, the act of establishing and upholding minimum retail prices might be regarded as philanthropy on the manufacturer's part. It is a sort of selfish philanthropy—a species which is greatly in vogue at the present time. However, if the manufacturer decided that a police supervision of retail prices did not warrant the effort expended, he would allow retail profits to take care of themselves. Price maintenance is a matter of co-operation. Co-operation is another term for mutual self-protection.

Price maintenance would be a work of supererogation if it were not for a commercial vice that is common to us all—that is, an insatiable greed for business. The more we get the more we want, and the more we want it. Every business man must eventually learn that some sales are best when lost. Don't be too hoggish, if you will pardon the term. Let the other fellow have the unprofitable business.

Gilded Cheapness.

I may be mistaken, but I believe that the idea of "cheap, cheap," has been carried too far. Exorbitant profits are suicidal, but cut throat competition is both murderous and suicidal. Of course consumers are attracted by bargains, and, if the bargain theme is properly conducted, it is a paying proposition. Yet the effort to get leaders and baits has resulted to such an extent in gilded cheapness that the consumer is becoming wise. You know well enough that goods must be made cheaply in order to sell at ridiculously low prices.

Just think of yourself as a consumer for a moment. Do you patronize your grocer because he has the reputation of being cheap? or your tailor? or your doctor? or your preacher? No. You want good food, not cheap food; you want good clothes, not the kind that you're ashamed to look in the face; you want good medicine and treatment, not quackery; you want good sermons, or, at least, you should. As a consumer you consider the word "cheap" a danger signal. Your customers have similar sentiments in kind, if not in degree, and they can be further educated.

Protects the Sheep from the Goats.

After all, we all desire value received for value given. We patronize the retailer who has convinced us that he will give us a square deal under all circumstances. But there will always be price cutters. The manufacturer knows this, and by establishing retail prices protects the sheep from the goats. The firm which I represent has never had a great deal of trouble with price cutting, but we are always on the lookout for the fellow who kicks over the traces.

I advise the dealers here assembled to promote quality rather than cheapness. If you desire to make leaders once in a while, however, don't use goods on which the price is established. There are plenty of other things. Co-operate in maintaining prices for your own protection and assist the manufacturer in bringing price cutters to time.

A Popular Policy.

There is more than one side to the question of price maintenance. In fact, I think that it is a polygon. It is not the only question of this kind, however. I know some arguments against price maintenance. But that is nothing remarkable, for I know some good arguments against eating, drinking, marriage, work, play, government, &c. The human mind cannot entertain a positive thought without recognizing its negative. As a firm we have agreed upon a policy of price maintenance. Our policy has been successful to a most gratifying degree. The majority of retailers are pleased with our method of price maintenance, and we are not influenced by negative arguments. The best that any of us can do is to choose the less of two evils or the better of two alternatives. It's easy to debate a question, but hard to formulate a perfect policy. If any of you think that price maintenance is a mistake, I suggest that you do not throw it overboard until you have ascertained an alternative of positively greater benefit.

A LIFETIME IN THE HARDWARE BUSINESS IN ARKANSAS.*

BY C. T. ROSENTHAL, BATESVILLE, ARK.

My career as a Hardwareman commenced February 1, 1865, when I was engaged by Pratt & Fox, St. Louis, then the largest Hardware firm west of the Mississippi. Subsequently I worked for several other wholesale houses, and had been working for McCombs, Caruth & Byrnes for four or five years when I started business on my own account in Batesville in 1878. So I had 13 years' experience in the wholesale Hardware business at the time I commenced business for myself nearly 30 years ago.

Then we had no railroad connection, the last 70 miles the goods came by steamboat. Still goods were not longer in transit than they are now. Freights were about 10 per cent. higher than at present; first cost of goods averaged about 10 per cent. higher. There were quite a number of goods that were cheaper then; others, such as axes and nails, were considerably higher, but 10 per cent. on present prices will be about right.

C. T. ROSENTHAL.

At that time nearly all goods came in paper packages. Manufacturers did not pay the same attention to putting up goods in neat, attractive and convenient packages as is done now; hence, to keep goods in order and make shelves look tidy required considerably more time than it does now.

Travelers' Calls.

We had about 80 to 90 calls from traveling salesmen during the entire year; now we have 1100 to 1200 calls annually. Merchants went to market quite often, especially those that were not well posted in their business. This is not necessary now, as goods and prices are brought right to you.

Turning Stock.

At that time, also, merchants were in the habit of buying annually two large bills, one in the fall and one in the spring. The balance were small, sorting-up orders, and this custom still prevails to a certain extent. Personally I am not in favor of this and cannot see the use of it, except that it enables a merchant to arrange and mark his goods at his leisure and have them in the house. On the other hand, he is apt to buy more than he can sell in certain lines, and has more capital invested in merchandise than is necessary; hence, cannot turn his stock as many times. We did the same amount of business in 1878 to 1885 on a much smaller stock than we can now.

At the time we commenced business here the bulk of the sales was made from September 15 to March 31. In this period there was a constant rush, while the balance of the year there was very little doing. Our business territory extended half way to Springfield, Mo. People came here by wagon, some of them 125 miles.

Personal Influence Counted, Not Price.

Selling goods was on an entirely different basis than now. The merchant's personal influence counted with the customer more than price. A large number of farmers mortgaged their crops to the merchants, and these merchants had it almost their own way, and could charge for goods what they wanted to, and were almost certain to get all of this farmer's trade. Other farmers that were not mortgaged bought of the old established merchant because they had known him for years, thought he was clever, &c., and hardly ever inquired into prices to see whether the old merchant really treated them as friends.

A Tough Sort of Competition.

When we came here we found competition, fierce competition, and of a kind not all expected. Day after day people came to our store and priced goods, but rarely ever bought. I saw these same people leave the town with Hardware bought at some other store. I knew that our prices were low, and saw no reason why we should miss the sales. Finally I interviewed some of these people, and after considerable persuasion they told me they had sold their cotton to a merchant who had told them to go to my store, price the goods needed, and had promised to come back and buy from him, the merchant agreeing to sell them at my price or less.

A Typical Case.

I will mention one instance: One evening the clerks and my partner had gone home about 9 p.m., and I was just ready to do the same when a party of three men came in to price goods. They priced nearly all goods in the store. I tried hard to sell them, but without success. They made notes off and on. Among other things I had a Stock and Die that suited them exactly, but the farmer wanted to show the description to his partner, and he said he would get it next morning if satisfactory. He took down the number, make and full description. Our price on this Stock and Die was $7. However, to see if I could not start him buying, I asked him $4, but he would not take it. After pricing some more goods the party left at 11.30 p.m.; had kept me two and a half hours without buying a cent's worth.

About three weeks later a clerk from one of my competitors called and asked me whether we had a Stock and Die, No. 62. I told him I thought we had, and while I was looking for it he went on to say that they had tried to order it for a customer, but could not find it in St. Louis. I handed out the goods, and said the price was $7. He objected, stating that I had offered it at $4 to his customer. I asked him then why he had offered to order it for this man at the price, when his house did not know the cost of it, and when he could get it right in town for $4. He said his house thought that if we had offered it for $4 they could get it for that price or less. He tried pretty hard to get me to sell it to him for $4, or, at all events, at less than $7, but I refused. When this man had left, I called my partner and clerks, and informed them of the situation. My competitor sent different clerks, even farmers, to get this Stock and Die, but the outcome was that they paid us $7 and got $4 for it.

Circumventing Competitors.

Another way our competitors had, was to represent to the customer that we had only Hardware to sell, while they had everything the customer wanted, and they could sell him so much cheaper if he bought everything from them. Besides this, our competitors had quite a number of reasons to impress upon the customer, why he should not buy from us, but from them. To counteract this kind of competition, we put in a stock of groceries, furnished supplies on mortgaged crops, and also bought cotton. I did not like to do these things, but in self-defense we had to do something, and this served the purpose pretty well. We also got better acquainted with our customers, and after we gained a firm foothold we dropped groceries and buying cotton.

General Expenses Were Considerably Less.

Expenses then were considerably less than now. Clerk hire cost one-half, advertising very little, and housekeeping expenses only one-half to two-thirds of present cost. Comparing present conditions with those of 20 years ago, will say a good many towns of some importance with fair stocks of Hardware have sprung up in our former territory, thus cutting into our trade considerably. However, to compensate the country is much more thickly settled, and, all told, there are considerably more goods sold in our city than formerly.

The Changes and Improvements

in doing business since 1878 are great. Goods come to us in neat and suitable packages; stores are arranged conveniently and tastefully. Cleanliness is more in evidence than formerly; the relation of merchant and customer is on a higher moral basis; the old "get his price and come back and trade with me" has been almost entirely discarded. The customer is more exacting, wants a better assortment to select from, better goods at a fair price, and the merchant who can meet these conditions will not want for business.

The cash register, the typewriter, adding machine, loose leaf books and a good filing system have reduced office work one-half or more. All these changes have come very gradually, and any merchant with common sense has found time and opportunity to adopt all the improved methods now in use. Those that cannot or will not adapt themselves to present methods will be left behind, for "survival of the fittest" is eminently in evidence in the mercantile vocation at the present time.

* A paper read at the recent annual convention of the Arkansas Retail Hardware Association.

JULY 16 the Navy Department, Bureau of Supplies and Accounts, will open bids for a quantity of material which includes the following items of interest to the Hardware trade: Stove and Machine Bolts, Twist Drills, Brass Nuts, Wood and Machine Screws, Padlocks, Asbestos Millboard, Flax Packing, Valves and Pipe Fittings and considerable quantities of metals.

SEYMOUR'S SHEARS.

WIEBUSCH & HILGER, LTD., 9 to 15 Murray street, New York City, sole agents for the H. T. Seymour Shear Company, have just issued an attractive display sign in the interest of Seymour's Shears. The sign is of extra heavy cardboard, and is 9 by 15 in. in dimensions. The surface is a very good representation of dull finished mahogany, the border and letters being inlaid in white with a high finish giving the resemblance of ivory. The Shears and the hand holding them are in natural colors, and the sign is a handsome and striking production. The signs will be furnished to merchants on application to Wiebusch & Hilger.

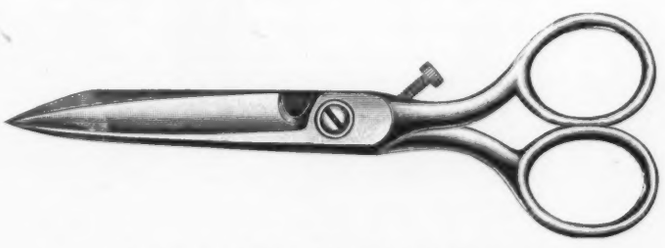
MISCELLANEOUS NOTES.

The Pittsburgh Motor Boat and Automobile Vises.

The Pittsburgh Automatic Vise & Tool Company, Pittsburgh, Pa., is manufacturing a vise suited to the many requirements of a motor boat or automobile operator. The base of the vise is 1¾ in. in diameter and is attached to the deck floor, running board or floor as a fixture, being small and unobtrusive. The vise is inserted in the base socket when it is to be used, and at other times may be put in the tool box. When the vise is put in the base it is perfectly free to turn in a complete circle, but as soon as the jaws are tightened on a piece of work, the vise is automatically clamped to its base and cannot move until the work is released, when it is again free to swivel. There is another swiveling motion, so that the jaws can be swung clear around on the axis of the screw, and, as in the case of the horizontal movement, the tightening of the jaws on the work clamps the swivel automatically. These movements make it possible to get the work into almost any position for convenience in filing, &c. The vise has 1¾-in. jaws, opening 3 in., weighing 3½ lb., and is finished both nickel plated and aluminum. The parts subjected to stress are of alloy steel and the screw is a steel forging, all parts being interchangeable. The base is so designed as not to be affected in any manner by the clogging or accumulation of any substance, and is thus always ready for the reception of the body. By the use of extra bases the vise can be utilized instantly on a work bench, in a shop or wherever a base can be secured.

Combination Button Hole and Ladies' Shears.

The Atlas Shear Company, 230 North avenue, Bridgeport, Conn., New York office 7 Warren street, has just put on the market a line of carbonized shears and scissors



Combination Button Hole and Ladies' Scissors.

known as combination button hole and ladies' shears, No. 250, one of which is here shown. They are made in three styles, as a ladies' scissor, 6 in., illustrated herewith; straight trimmer, 7 in., and bent trimmer, 8 in., all having the same button hole cutting feature. They can be furnished with brass bolt and nut, or steel screw pivot, and the shears proper are polished and nickeled throughout. Both members of the shear are ground as illustrated, making an opening of about ⅜ in. oval diameter, which, controlled by the brass milled head screw operating at an angle, determines quickly the length of necessary incision for a button hole. The shears can be used for ordinary cutting and button hole making and are moderately priced.

Carborundum Specialties.

The Carborundum Company, Niagara Falls, N. Y., is marketing carborundum stones for special purposes, among which are those shown in the accompanying cuts. Machinists' special stone, Fig. 1, is fast cutting and holds its shape. The grit and grade of hardness is adapted

Fig. 1.—Carborundum Machinists' Special Stone.

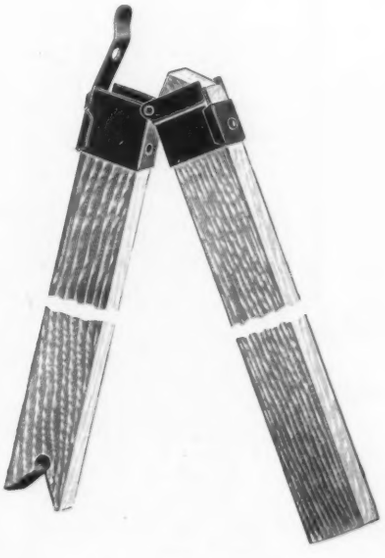
for sharpening lathe and planer tools, milling cutters, reamers and drills. It is alluded to as of handy size, not so large as to be clumsy nor too small to be efficient, as uniform in hardness and convenient in shape. Oil or water may be used without injurious effect to the stone or cutting qualities, and every stone is guaranteed. The Sportsmen's combination stone, Fig. 2, is designed for

Fig. 2.—Carborundum Sportsmen's Combination Stone.

hunting outfits. One side of the stone is of a coarse grit, to sharpen dull knives; the other side is of a very fine grit, to put a keen edge on knives. Sportsmen's stones are furnished in neat, soft leather cases, 4 x 1 x ⅜ in., of a convenient size for the pocket.

M. & W. Hinged Folding Clothes Prop.

Stark Novelty Company, Canton, Ohio, is offering the hinged folding clothes prop here illustrated. The prop is

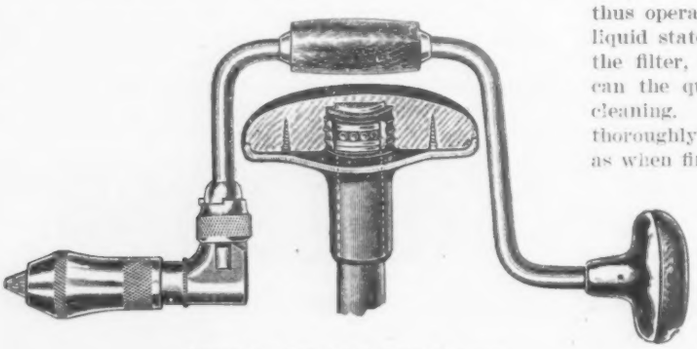


M. & W. Hinged Folding Clothes Prop.

strongly made, in 8, 10, 12 and 14 ft. lengths. The small spring containing hole is adjustable, so that when it wears it can be moved back, making it as tight as ever.

Lancaster Concealed Ratchet Brace.

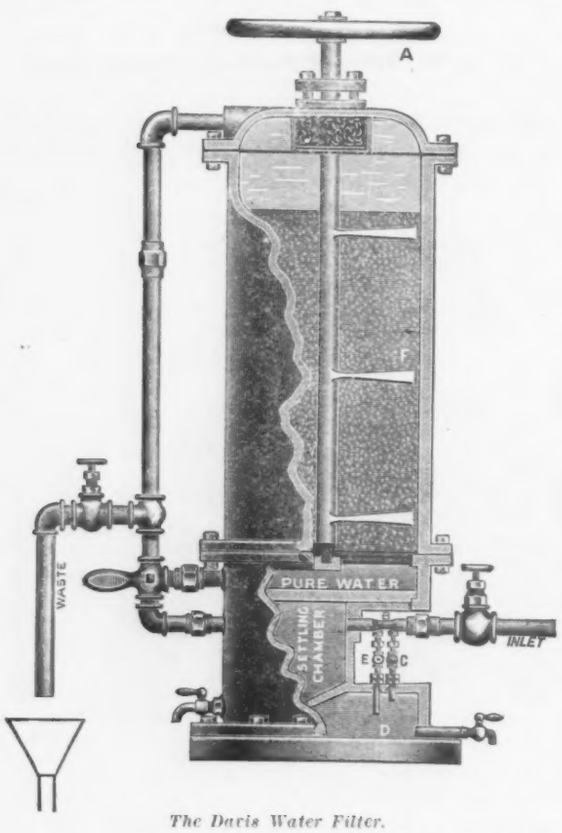
The Lancaster Machine & Knife Works, Lancaster, Pa., New York office managed by George W. Davis, 7 Warren street, has recently put on the market the concealed ratchet brace, here illustrated. The concealed ratchet makes it possible to use the brace either right or left handed, or to set it so as to have a rigid one way brace. It is made in 6, 8, 10, 12 and 14 in. sweep, cocobolo handles and centers, and there are new patent ferrules each side to hold securely the coco-bolo center. There is also a concealed ball bearing head, as shown in the detail cut of head, the bearing being between two steel washers, also concealed, which protect the working parts from dust and moisture. An oil hole is provided by which to conveniently lubricate the head. The tool is offered as strictly high grade and of fine finish, the metal parts being highly polished and triple nickel plated. The jaws, alligator pattern, are drop forged, and there are long square cut threads on the shaft.



Lancaster Concealed Ratchet Brace.

The Davis Water Filter.

Stoner, Thaw & Co., Limited, Pittsburgh, Pa., are offering a water filter of which a broken away view is given herewith. It consists of a large cylinder filled with filtering material, through which the water to be cleaned and purified must pass before it is delivered to the pure water chamber, which is entirely separate from the settling chamber. When the filter becomes more or less filled with sediment it is a simple matter to reverse the flow of water through the filter, scouring the filtering material, which can be agitated by turning the hand wheel, thus operating the blades when the quartz is in a semi-liquid state. When reversing the flow of water through the filter, waste water cannot enter the filter bed, nor can the quartz, used for filtering, be discharged while cleaning. The point is made that the filter can be thoroughly cleansed in 5 to 10 min., leaving it as clean as when first put in, enabling the operator to get filtered water immediately after. The filter is made in eight sizes and capacities, being adapted to connection with supply pipes from ½ in. to 3 in. in diameter, and having a capacity of from 100 to 3700 gal. per hour. The larger sizes are adapted for use for ice manufacturers, breweries, factories, hotels, laundries, &c., and the smaller sizes for residences.



The Davis Water Filter.

The Thomas Improved Washboiler.

The Improved Washboiler Company, 119 Monroe street, Chicago, Ill., is offering the improved form of washboiler shown in the accompanying cuts. The cover consists of two sections as illustrated in Fig. 1. By turning back the small section, Fig. 2, an opening is formed through which clothes and water can be put in the boiler. The larger section of the cover is used as a spout to catch the drip when clothes are taken out of the boiler and put in the tub, the water running into the tub instead of onto the stove and floor. To empty the water the boiler is lifted at one end when the small section partly opens, thus preventing the escape of a large amount of steam. Thus the two hinged portions of the cover obviate the necessity of removing the cover while the boiler is in use.

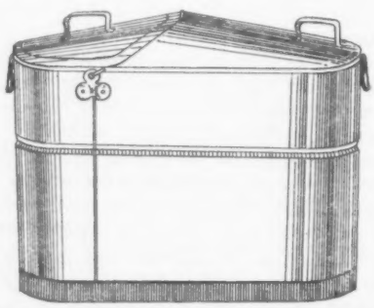


Fig. 1.—The Thomas Improved Wash Boiler.

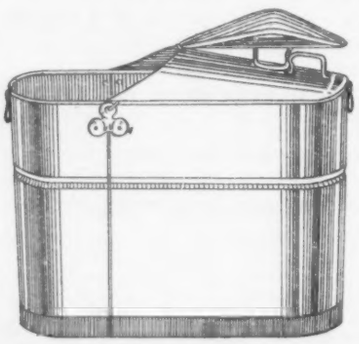


Fig. 2.—Small Section Open for Filling Boiler, Putting in Clothes, &c.

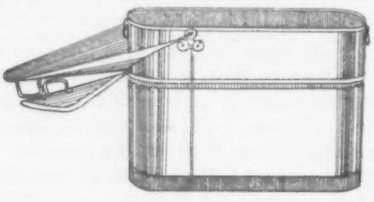


Fig. 3.—Trough in Use When Removing Clothes.

Clauss Automatic Safety Razor.

The Clauss Shear Company, Fremont, Ohio, and 7 Warren street, New York, is manufacturing the Clauss

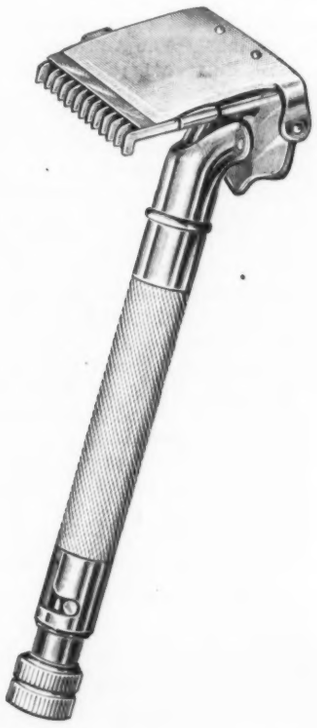


Fig. 1.—Clauss Automatic Safety Razor.

automatic safety razor here illustrated, full size. The metal frame and handle has no loose parts, is practically one piece and is polished and silver plated. The removable wafer blades, with one cutting edge, are made of a special high grade Sheffield steel rolled to the company's specifications. A blade can be instantly inserted or removed by a partial turn of the milled end of handle to the left, pushing it slightly forward and again turning to the left, which by means of the bayonet like catch locks open the spring actuated clamp. The blade can then be placed on the bed of the comb, the handle end reversed and locked securely and automatically, without the exercise of any skill in adjustment, there being an ingenious and simple device on the under side of clamp pushing the blade forward into its proper position, from which it cannot recede. The cutting edge is beveled on both sides about ⅛ in. Both blades and frame are immersed in an acid antiseptic solution and each blade is put up separately in a sealed envelope. No honing or stropping is contemplated in the use of this razor, 12 wafer blades accompanying each frame, packed in a receptacle marked "unused," there being also a similar container for "used" blades, extra blades being furnished at nominal cost. A distinguishing feature of the blades is that the grain of the steel is parallel with the cutting edge, thus insuring, we are advised, a much more uniform cutting edge. The outfit is handsomely put up in a fine black morocco case, in dimensions 4¼ x 2 x 1⅝ in., lined with purple velvet below and satin above, with hinged cover and silver plated catch, which is tissue wrapped and enclosed in a pasteboard box. The razor is fully warranted.

Fig. 2.—Hinged Cover, Morocco and Silk Lined Case.

Carving Set and Kitchen Knives.

Harrington Cutlery Company, Southbridge, Mass., George W. Davis, manager of New York branch, 7 Warren street, has put on the market the carving set shown in Fig. 1. The carving blade resembles in shape and quality a knife previously made for butchers, but not heretofore adapted for table use. The blade is made of English crucible tool steel, high grade, and is finely ground and honed for instant use. About 2 in. on the back from the point it is also sharpened in the same way, making it especially serviceable for carving turkey, chicken or other game, particularly when disjointing or working in and out about a bone. The handles of both carver and fork are Rubberoid, impervious to hot water, and the flat bolsters are nickel plated. Fig. 2 represents a "bunch of cutters," including a similar carver, together with a bread knife and kitchen or paring knife. All have the same characteristics in quality, handles and finish, are trademarked Dexter, and are unqualifiedly guaranteed, the company having manufactured cutlery since 1818. Both sets are put up in neat double pasteboard boxes, easel back for counter display, and are moderately priced.

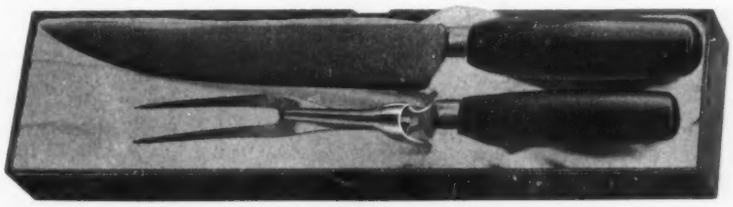


Fig. 1.—Turkey Carver and Fork.

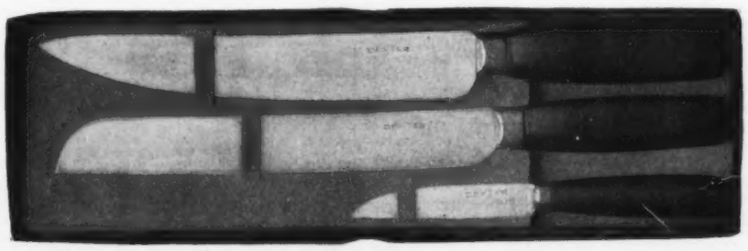
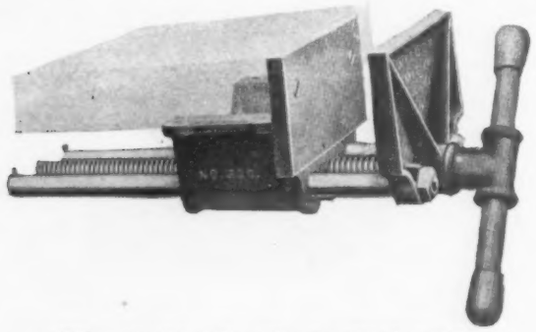


Fig. 2.—Carver, Bread and Paring Knives.

Wilcox Rapid Acting Vise for Woodworkers.

Wilcox Mfg. Company, Aurora, Ill., is putting on the market the woodworkers' rapid acting vise shown herewith. The adjustment is instantaneous and the vise is continuous in action. The screw is cut with a single thread, four to 1 in., with sharp pitch. Hence, it is ex-

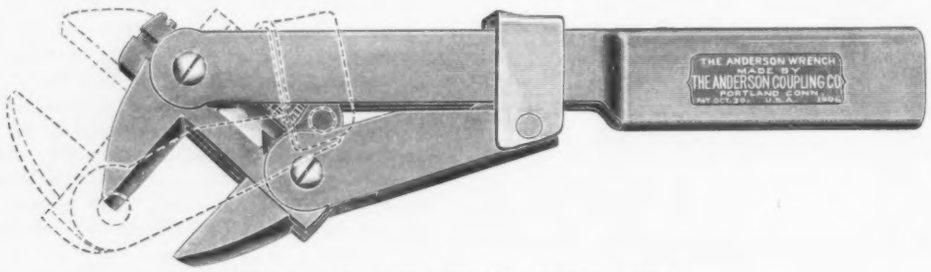


Wilcox Rapid Acting Vise for Woodworkers.

plained, it has double the power or pressure of a double thread screw. The guides are of cold rolled steel and the jaws are of best gray iron, with working surfaces ground and finished. It is pointed out that the special design of the ribs on the jaws secures minimum deflection or spring under pressure, as well as minimum weight. Among the advantages claimed by the manufacturer is that there are no pawls, racks or triggers in the construction of the vise; that the nut is released and completely disengaged when pressure on the work is removed by a slight reverse movement of the handle; that the threads will not strip or cut, and that when pressure is applied it causes the nut to engage and lock the screw more firmly and is not held in position by any external mechanism. The vise is made in two sizes, No. 1, with jaws 7 in. wide, and No. 2, with jaws 10 in. wide, weighing 29½ and 39½ lb. respectively.

Anderson Adjustable Turn-More Wrench.

The Anderson Coupling Company, Portland, Conn., is just putting on the market the Anderson adjustable Turn-More wrench here illustrated. The wrench is also made similarly with jaws of one solid steel casting, machined for both square and hexagon nuts, this style being made to fit nuts on each ⅝, ¾ and ⅞ in. bolts. The adjustable wrench can be regulated from 0 up to an effective spread of 1¾-in. opening by means of a knurled worm. The handle and bar are stamped from one piece of 1-16-in. sheet steel, as are the other two movable parts which actuate the jaws. With either of these styles of wrenches nuts can be speedily ratcheted into place or removed, and they are especially serviceable in close or difficult quarters, although equally useful as an ordinary rigid wrench. The wrenches are offered as great time savers in assembling machinery, agricultural or kindred implements. The ratchet pawl works against a machine toothed steel bar 3¾ x ½ x 7-16 in. in dimensions, set in the hollow bar or handle, the teeth being 3-16 in. long. The handle proper is 3¾ x 1¼ x ¾ in., slightly rounded top and bottom, comfortably filling the palm and affording a good grip. The various positions of the jaw, indicated partially by the dotted lines, are instantly effected by a slight thumb pressure on back of yoke, under which is a small flat steel spring which travels back and forth in a groove pressed into the back of the bar. At present only the 10-in. (over all) sizes of adjustable and one-piece jaws are ready for delivery, but later it is the intention to get out 8 and 12 in. and possibly two larger sizes.



Anderson Adjustable Turn-More Ratchet Wrench.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, City, raw	.45 @48
City, Boiled	.46 @47
State and Western, raw	.44 @45
Raw Calcutta, in bbls	.70
Lard, Extra Prime, Winter	.77 @78
Extra No. 1	.37 @38
No. 1	.49 @52
Cotton-seed, Crude, f.o.b. mills	.31 @42
Summer Yellow, Prime	.59 @59½
Summer White	@62
Yellow Winter	@62
Sperm, Crude	.59 @60
Natural Winter	.72 @73
Bleached Winter	.75 @76
Bleached Winter, Extra	@..
Tallow, Prime	.60 @61
Whale, Crude	.35 @36
Natural Winter	.46 @47
Bleached Winter	.48 @49
Extra Bleached Winter	.50 @51
Menhaden, Brown, Strained	.32 @33
Light Strained	.32 @33
Northern	.26 @27
Southern	.26 @27
Cocoanut, Ceylon ₱ lb	9 @ 9¼
Cochin ₱ lb	10¼@10¾
Cod, Domestic, Prime	.36 @38
Newfoundland	.40 @42
Red, Elaine	.48 @51
Saponified ₱ lb	7 @ 7¼
Olive, Italian, bbls., Yellow	.85 @1.00
Neatsfoot, Prime	.56 @57
Palm, Logos ₱ lb	7 @ 7¼

Mineral Oils—

	₱ gal.
Black, 29 gravity, 25@30 cold test	12½@13
29 gravity, 15 cold test	.13 @13½
Summer	.12 @12½
Cylinder, light filtered	.19 @20
Dark, filtered	16½@17½
Paraffine, 903-907 gravity	.14 @14½
903 gravity	.13 @13½
883 gravity	10¾@11¼
Red	.13 @14½

Miscellaneous—

Barytes:	
White, Foreign ₱ ton	$18.50@20.50
Amer. floated ₱ ton	19.00@20.00
Off color ₱ ton	13.00@16.50
Chalk, in bulk ₱ ton	3.00@ 3.25
In bbls ₱ 100 lb	.@ .35
China Clay, Imported ₱ ton	11.00@17.50
Cobalt, Oxide ₱ 100 lb	2.50@ 2.60
Whiting, Commercial ₱ 100 lb	.43@ .52
Gilders ₱ 100 lb	.55@ .65
Ex. Gilders ₱ 100 lb	.60@ .65

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls	.60½@61
In machine bbls	.61 @61½

Glue—

	₱ lb
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @24
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	.44 @45
Bone Dry	.53 @54
Button	.40 @50
Diamond I	.59 @60
Fine Orange	.52 @57
A. C. Garnet	.. @46
Kala Button	.35 @36
D. C	.62 @63
Octagon B	.56 @57
T. N	.44 @46
V. S. O	.59 @60

Colors in Oil—

	₱ lb
Black, Lampblack	.11 2 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	.. @24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	.10¼@10¾
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 7½
Lots less than 500 lb, in Oil	@ 8
Lead, White, in oil, 25 lb tin pails, add to keg price	.. @ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	.. .. @ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	.. @ 1½

Lead, American. Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	₱ lb
Zinc, American, dry	.5½@ 5½
Zinc, French:	
Antwerp, Red Seal, dry	.8¾
Antwerp, Green Seal, dry	.10¾
Paris, Red Seal, dry	.9¼
Paris, Green Seal, dry	.11

Zinc, V. M. French, in Poppy Oil:
Green Seal:
Lots of 1 ton and over ..... 13⅛@13⅜
Lots of less than 1 ton ..... 13⅜@13⅞
Zinc, V. M. French, in Poppy Oil:
Red Seal:
Lots of 1 ton and over ..... 11⅞@12⅜
Lots of less than 1 ton ..... 12⅛@12⅝
Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	.6½@10
Black Drop, American	.3½@ 8
Black Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, Com	.4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.30 @33
Blue, Prussian	.28 @32
Blue, Ultramarine	.3½@15
Brown, Spanish	.½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	.3½@ 7
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls., kegs	.. @ 7¾
Litharge, bbls., ½ bls., kegs	.. @ 7¾
Ocher, American ₱ ton	$8.50@16.00
American Golden	.2½@ 4
French	.1¼@ 2
Foreign Golden	.3 @ 4
Orange Mineral, English	.10 @12
French	.11¾@12
German	.10 @12
American	.8¾@ 9
Red, Indian, English	.4¼@ 6
American	.3 @ 3¼
Red, Turkey, English	.4 @10
Red, Tuscan, English	.7 @10
Red, Venetian, Amer. ₱ 100 lb	$0.50@1.25
English ₱ 100 lb	$1.15@1.60
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	.1¼@ 2
American Burnt and Pow'd	.1¼@ 2
Talc, French ₱ ton	$18.00@25.00
American ₱ ton	15.00@25.00
Terra Alba, French ₱ 100 lb	.90@ 1.00
English ₱ 100 lb	.80@ 1.00
American ₱ 100 lb, No. 1	.75@ .80
American ₱ 100 lb, No. 2	.60@ .65
Umber, T'key, Bnt & Pow	.2 @ 3¼
Turkey, Raw and Powdered	.2¼@ 3½
Burnt, American	.1¼@ 2
Raw, American	.1¼@ 2
Yellow Chrome, Pure	.12 @14
Vermilion, American Lead	.7 @25
Quicksilver, bulk	.65 @..
Quicksilver, bags	.@66
English, Imported	.65 @70
Chinese	.$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent....35%
Taplin's Perfection....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ℔ doz. pairs....$2.00@$3.00

Anvils—American—

Eagle Anvils....℔ lb @8½¢
Hay-Budden, Wrought....9½@9¾¢
Trenton....℔ lb 9½@9¾¢

Imported—

Peter Wright & Sons, ℔ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co....33⅓%

Augers and Bits—

Com. Double Spur....70&10@75%
Jennings' Pat., reg. finish....60&5@60&10%
Black Lip or Blued...65@65&5%
Boring Mach. Augers....70%
Car Bits, 12-in. twist....40&10%
Ford's Auger and Car Bits....40&5%
Ft. Washington Auger Co., Conard's....35%
Forstner Pat. Auger Bits....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&7½%
No. 30, R. Jennings' list....50%
Russell Jennings'....25&10&2½%
L'Hommedieu Car Bits....15%
Mayhew's Countersink Bits....45%
Pugh's Black....20%
Pugh's Jennings' Pattern....35%
Snell's Auger Bits....60%
Snell's Bell Hangers' Bits....60%
Snell's Car Bits, 12-in. twist....60%
Snell's King Auger Bits....50%
Wright's Jennings' Bits....50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....60&10%
Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18....60&10%
Ford's, Clark's Pattern....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00....60&10%
Swan's....60%

Gimlet Bits—

	Per gro.
Common Dble. Cut....	*$3.00@3.25*
German Pattern, Nos. 1 to 10,	*$4.75; 11 to 13, $5.75*

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames....25&10%
Universal....20%
Wood's Universal....25%

Ship Augers and Bits—

Ship Augers....40&10%
Ford's....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's....6%
Watrous'....33⅓&7½
Snell's....40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality....$4.75@5.00
Second Quality....$4.25@4.50
Double Bit, base weights:
First Quality....$7.00@7.50
Second Quality....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—Iron or Steel

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose..5½@4 ¢
No. 1¼ Com., New Style5¾@4¼¢
No. 2 Solid Collar....5¾@4¼¢
Half Patent.
Nos. 7, 8, 11 and 12....70@75%
Nos. 13 to 14....70@75%
Nos. 15 to 18....75@75&5%
Nos. 19 to 22....75@75&5%

Boxes, Axle—

Common and Concord, not turned lb., 4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait....20%
B Bait....25%
Competitor Bait....20&5%

Balances—Sash—

Caldwell new list....50%
Pullman....50&10@60%

Spring—

Spring Balances....50&10@60%
Chatillon's:
Light Spg. Balances....50@50&10%
Straight Balances....40@40&10%
Circular Balances....50&10%
Large Dial....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¢

Towel

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams....40%
Chattillon's No. 1....30%
Chattillon's No. 2....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned....$0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned....$1.20
No. 10 Wire Tinned....℔ doz. $1.50
Western W. G. Co.:
No. 1 Electric....℔ gro. $7.80
No. 2 Buffalo....℔ gro. $9.00
No. 3 Perfection Dust....℔ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover....$6.00
Western, W. G. Co., ℔ gro., Buffalo, No. 2, $8.00; Perfection, No. 3, $9.00.
Wonder (R. M. Co.)...℔ gro. net, $8.40

Bellows—

Blacksmith, Standard List..
Split Leather....60&10@65%
Grain Leather....50@50&10%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz..	*$5.00*	*5.50*	*6.00*	*6.50*	*7.50*

Molders—

Inch..	*10*	*12*	*14*	*16*
Doz..	*$7.50*	*9.00*	*12.00*	*15.00*

Net Prices.

Bells—Cow—

Ordinary Goods...75&5@75&10&5%
High grade....70&10@75%
Jersey....75&10%
Texas Star....50%

Door—

Barton Gong....35@40%
Home, R. & E. Mfg. Co.'s....55&10%

Hand—

Polished, Brass....50@50&10%
White Metal....50@50&5%
Nickel Plated....40&10@50%
Swiss....50&10@50&10&5%
Cone's Globe Hand Bells....33⅓@35%

Miscellaneous—

Farm Bells....lb., 2¼@2½¢
Church and School....60@60&5%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard....70&5%
Light Standard....75%
Cut Leather Lacing....40&5%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard....70@70&5%
Extra....60&5@60&10%
High Grade....50&5@50&10%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters....20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes....50%
Tubes....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden....75%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior....30%
Stowell's Novelty, Mal. Iron....50%
Stowell's Loading....50&10%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined....40%
Embossed....50%

Boards, Wash—See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅝ × 6 and smaller....70&5@...%
Larger and Longer..60&2½@—%
Phila. Eagle $3.00 list May 21, '99 40%
Bolt Ends....65@65&5%
Machine (cut thread):
⅝ × 4 and smaller..70&7½@—%
Larger and longer..60&7½@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch....	*3*	*4*	*5*	*6*	*8*
Per doz..	*$1.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch....	*6*	*8*	*10*
Per doz..	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch....	*6*	*8*	*10*
Per doz..	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch....	*6*	*8*	*10*
Per doz..	*$0.75*	*.95*	*1.25*

Wrought Barrel Japd..80@80&10%
Barrel Bronzed....60&10%
Spring....70&10@70&10&10%
Shutter....50&5@50&10&5%
Square Neck....75@75&10%
Square....70&10&10%
Ives' Patent Door....55%
Ives' Wrought Metal....45%

Expansion—

Richards Mfg. Co....50&10%

Plow and Stove—

Plow....65&10@—%
Stove....85@85&5%

Tire—

Common Iron....80%
Norway Iron....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99....80%
Norway Phila., list Oct., '84....80%
Eagle....82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch....	*2¼*	*2½*		
Per doz....	*$5.65*	*11.50*		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each....25%

Boxes, Mitre—

C. E. Jennings & Co....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme....15&10%
Perfection....40%
Seavey....45%

Braces—

Common Ball, American....$1.50
Barber's....50&10&10@60&10%
Fray's Genuine Spofford's....60%
Fray's No. 70 to 120, $1 to 123, 207 to 414....60%
C. E. Jennings & Co....50&5%
Mayhew's Ratchet....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel....75@75&10%
Griffin's Folding Brackets....70&10%
Stowell's Cast Shelf, 50%; Sink...50%
Western, W. G. Co., Wire....60&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co....75&20%
Western, W. G. Co....80%
Wire Goods Co....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart..	*10*	*12*	*14*	
Water, Reg...	*25.35*	*28.00*	*32.00*		
Water, Hvy...	*45.35*	*48.00*	*52.00*		
Fire, Rd. Btm.	*32.00*	*34.65*	*38.65*		*10&5%*
Well....	*37.35*	*41.35*	*45.35*		

Bucks, Saw—

Hoosier....℔ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, High List, Oct. 26, '06. 45@45&10%
Cast Brass, Tiebout's....40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint....70&10@75%
Loose Pin....70&10@75%
Mayer's Hinges....70@70&5
Parliament Butts....70@70&5

Wrought Steel—Discount

Reversible and Broad....70&5%
Light Reversible, Light Narrow....70&5%
Loose Joint, Narrow, Light Inside Blind, etc....70%
Back Flaps, Table Chest....65%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900....30%

Hendryx Bronze; Series 700, 800..30%
Hendryx Enameled.....35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4¼@4¾¢
Sharp, 1 prong, per lb., 4¾@5¼¢
Burse's Blunt, 3½@4¢; Sharp, 4@4½¢
Bautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ₱ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.85	2.00	2.15
New York Pattern	2.15	2.40	2.65
Dubuque	1.85	2.00	2.15

Cans, Oil—

R. M. Co., Family, ₱ gro.:

	1	2	5
Empire	$21.00	$33.00	$56.00
Buffalo			$66.00

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M.$1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd. $1.50
B. B. Caps, Round Ball....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....65&10%
Plate.....60&5%
Philadelphia.....70&10%
Acme, Ball Bearing.....35%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....70&10&10&5
Steel Gem.....20%
Martin's Patent (Phoenix).....35%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

5-16	¼	5-16	⅜	7-16	½	9-16
$8.77	6.17	5.02	4.57	4.37	4.27	4.22
⅝	¾	⅞ to 1	1⅛ to 1¼ inch.			
$4.17	4.07	4.02	4.12			

In cask lots, deduct 25¢.
German Coil.....60&10&10@70%

Halter—

Halter Chains.....60@60&5%
German Pattern Halter Chains, list July 24, '97.....60&10&5%
Covert Mfg. Co.
Halter.....35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring..$28.00
6½—6-2, Straight, with ring..$29.00
6½—8-2, Straight, with ring..$32.00
6½—10-2, Str'ght, with ring..$37.00

NOTE.—Add 2¢ per pair for Hooks. Twist Traces; add per pair for Nos. 2 and 3, 2¢; No. 1, 3¢; No. 0, 4¢ to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c.....60%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....50&10%
Safety and Plumbers' Chain, 60&10%
Gal. Pump Chain....lb. 4½@4¾¢
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Oneida Community:
American Halter, Dog and Kennel Chains.....35&2½@40%
Niagara Dog Leads and Kennel Chains.....45@50&5%
Wire Goods Co.:
Dog Chain.....70%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@$3.00
Sash Ribbon Attachments, per set..8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro., 50@55¢
Carpenters' Red....gro., 45@50¢
Carpenters' White...gro., 40@45¢

Checks, Door—

Bardsley's.....48%
Pullman, per gro.....$54.00
Russwin.....33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....50%
Youths' Chests, with Tools.....35%
Gentleman's Chests, with Tools..25%
Farmers', Carpenters,' etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....45%
Tool Cabinets.....45%
C. E. Jennings & Co.'s Machinists Tool Chests.....7½%

Chisels—

Socket Framing and Firmer

Standard List.....70&10@75%
Buck Bros.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan's.....66⅔&70%
L. & I. J. White Co.....30@30&5%

Tanged—

Tanged Firmers.....30&5@35%
Buck Bros.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold— lb.

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....35%
Universal, Reversible Jaws.....35%
Combination, Reversible Jaws....35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat., 25%; Positive Drive.....10%
Planer Chucks.....20%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....40%
Scroll Combination, Nos. 83 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318..35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35%
Union Czar Drill.....25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42.....30%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....40%
Steel Face Plate Jaws, Nos. 70 and 72.....30%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co.....50&10%
Resly, Parallel.....33⅓&10%
Myers' Hay Rack.....45%
Lineman's Swedish Neverturn.....65%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each.....$8.75 } 20%
Stewart's Patent Sheep Shearing Machine, each.....$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05, 80&80&10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.....60&10@65%
Compression Bibbs..55&10@60%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Wm. Schollhorn Co.:
Excelsior Dividers.....60%
Lodi Dividers.....70&10%

Conductor Pipe,—

L. C. L. to Dealers:

Galvanized Steel.	Galv. Iron.	Charcoal Iron.	Copper. 14, 16&20 oz.
Eastern:			
70%	50&7½%		30%
Central:			
65&10%	55&2½%		20&10%
Western and Southern:			
65&5%	50&7½%		20&7½%
So. Western			
50&25&2½%	50%		20&5%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

R. M. Co.:

Gal., ea.	2	3	4	6	8
Yukon	$1.25	$1.50	$2.00	$2.25	$2.75
Alaska	$2.25	$2.50	$3.00	$4.00	$5.00

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled.....10%
Agate Lined.....10%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 32@35¢; lighter than 3 lb. to pair.....34@37¢

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 26¢; No. 7, 26½¢; No. 6, 27½¢.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....lb., 11@11½¢
Cotton Sash Cord, Tw'ted.18@20¢
Patent Russia.....lb...20¢
Cable Laid Russia.....lb...21¢
India Hemp, Br'd'd.....lb...21¢
India Hemp, Twisted..lb.13@14¢
Patent India, Twisted...lb...17¢
Pearl Braided, cotton, No. 6, ₱ lb, 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ₱ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢ } 15%
Massachusetts, White.....₱ lb 40¢
Massachusetts, Drab.....₱ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906.85&10@85&10&10%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co, Wire Picture Cord.....85&10%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ₱ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.00
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $16.25; Indelibles.....$18.75
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x ¾ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light.....$5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters— Glass—

R. H. Mayhew Co.....40%
Red Devil.....60%
R. Mfg. Co.....40%
Woodward.....50%

Meat and Food—

American.....30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$1.50	$6

25@25&7½%
No. 202, $1.50.....40&7½%
P., S. & W. Co.:
Dixon's.....₱ doz. 33⅓%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40@40&5%
Hales.....60&10&5%
Little Giant.....₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605, ₱ doz. $24.00.....40&10%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
$15.00 $18.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters.....30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₱ doz. $1.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$30

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise.....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18.....40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ₱ doz., $24.00.....25%
Samson, ₱ doz., $34.00.....25%
Iwan's Imp'ved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ₱ doz., $7.00
Perfection Post Hole Diggers, ₱ doz.....$8.75
Split Handle Post Hole Diggers, ₱ doz., $7.75
Hercules Pattern, ₱ doz.....$10.00
Kohler's, ₱ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%

Dividers—See *Compasses.*

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines.....$1.50@$1.75
Breast, Millers Falls.....50&10%
Breast, P., S. & W.....33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W., 50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank..... 60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Disston's.....70%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co.....30%
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60%; Star, 30&10%
H. D. Smith & Co.'s Perfect H'dle.40%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory. Galv. Steel.	L. C. L. Galvanized Charcoal Iron.	Copper. 14, 16&20 oz.
Eastern:		
70&30%	70%	30%
Central:		
75&10&2½%	65&10%	20&10%
Western and Southern:		
75&7½%	65%	20&7½%
So. Western:		
75%	60&10%	20&5%

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:

	Galv. Steel	and Galv. C. I.
Standard Gauge		80%
No. 26		40%
No. 24		25%
No. 22		15%
Copper		40&10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece.....40&10%
Republic, Perfect Elbows.....50%

Emery, Turkish—

	¼ to ½:	5¼ to 220:	Flour.
Kegs.....lb.	5 ¢	5½ ¢	3½ ¢
½ Kegs.....lb.	5¼ ¢	5¾ ¢	3¾ ¢
¼ Kegs.....lb.	5½ ¢	6 ¢	4 ¢
10-lb. cans, 10 in case....	6½ ¢	7 ¢	6 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Wailing's .....40&10%
Upson's Patent.....40%

Cord and weight—
Ives and Titan.....33⅓%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined..
60&10@70%
Red Cedar.....40&10@50%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined..
50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined....50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, Liquor....⅌ doz. $8.25
Improved, ¾, $7.50; ⅞.....$8.25
Self Measuring:
Enterprise, ⅌ doz. $36.00.....40&10%
Lane's, ⅌ doz. $36.00.....40&10%
National Measuring, ⅌ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....35 1-3@40%

Fixtures, Fire Door—
Allith Underwriters' Approved.....50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co.....25%
Reading Hardware Co.....60%
Stowell's Giant Grindstone **Hanger**.. ⅌ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy, 40&10%; Light.....50%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.30*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....75@80%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c..67½%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.20
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.20; 2, $2.80
Spike, Wood Handled, No. 1, $4.20; 2, $4.60

Glass, American Window
See *Trade Report*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush..
25&10@50%
Elwell's 40%

Grease, Axle—
Common Grade....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ⅌ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50.....30%
Alundum Disc Grinders, each, $2.50 .....30%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ⅌ inch, ⅌ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....60&5@60&10%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'...55&10@55&10&5%
Heller's Farriers'.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....50%
Farriers' .....40&10&5%
Riveting 50%
Machinists', revised list.....66⅔&5%
Blacksmiths' .....50&5%
Fayette R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60@60&10%
Rivet and Tinners'.40&7½@40&12½&5%
Vaughan & Bushnell Mfg. Co.:
A. E. Nail.....40&2½@40&12½%
Machinists' .....50&15@60&5%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢.80&5@..%
3 to 5 lb., per lb., 40¢.80&5@..%
Over 5 lb., per lb., 30¢....
80&10&5@..%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40@45&5%
Fork, Shovel, Spade, &c.:
Long Handles.....40@45&5%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $2.50@3.00
Brad Awl.....gro. $1.65@1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory.....$1.45@1.60
Socket Framing, Hickory, $1.60@1.75
File, assorted.....gro. $1.30@1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...45@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel .....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.....
⅌ gro. $0.85@$1.50
W. A. Zelnicker Supply Co.:
Hammer, per doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, per doz., oval 30 in., $3.80; octagon, 30 in., $3.80; oval,36 in., $4.00; octagon, 36 in., $4.00.
Axe, per doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, per doz., 36 in., $5.80; 36 in., $7.80.
Pick, per doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, per doz., 12 to 14 in., $2.00.

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door.....50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&2½%
Roller Bearing.....70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Lawrence Bros.:
Advance .....55&10%
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Meyers' Stayon Hangers.....60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22.—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D., No. 29.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....30%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas 60%
Baggage Car Door.....50%
Climax Anti-Friction.....50%
Elevator 40%
Express 50%
Lundy Parlor Door.....50%
Matchless .....55&10%
Nansen .....70&2½%
Parlor Door, 50&10%; Railroad, 50&10%
Steel, Nos. 300, 404, 500.....50%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Wilbern, No. 0, net, ⅌ doz..$9.00
Zenith for Wood Track.....50%
A. L. Sweet Iron Works:
Eagle Roller Bearing....70&2½%
New Perfection.....55&10%
Pilot, Pilot Hinge.....60%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%

Extra 10@10% often given.

Hangers— Garment—
Pullman Trouser, ⅌ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro. $8.00; Garment Hanger Rods, Round Nickeled, per gro. $10.50; Garment Hanger Loops, Round Nickeled, per gro.....$10.50
Victor Folding.....⅌ gro. $9.60
Western, W. G. Co.....75&10%

Gate—
Myers' Patent Gate Hangers, ⅌ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ⅌ doz..60%

Hatchets—
Regular list, first qual..40&7½@—
Second quality.....50&10@—

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; **No. 3E, $3.25; No. 1, $3.50**.....25%
Clark Coal, ⅌ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70&75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.30; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ⅌ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Tip Pat'n, No. 1.....75&10%
No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch.....doz. ....@$2.00
Without Latch...doz. ....@$1.60
Reversible Self-Closing:
With Latch.....doz. ....@$1.75
Without Latch...doz. ....@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....50%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot. Steel Hold Back, ⅌ gr. $9.00
Richards Mfg. Co., Double Acting Floor Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ⅌ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ⅌ gr. $12.00
Columbian Hinges.....60&10%
Gem, new list.....30%
Clover Leaf.....⅌ gr. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Lawson Mfg. Co., Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....⅌ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ⅌ gr. pr.....$9.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ⅌ gr. $12.50
Ideal, No. 4.....⅌ gr. $9.00
New Idea No. 1.....⅌ gr. $9.00
New Idea, Double Acting....50%
New Idea Floor.....50%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges..50&10%
Heavy Strap Hinges..60&5%
Light T Hinges.....50%
Heavy T Hinges.....40%
Extra Hvy. T Hinges.50&10%
Hinge Hasps.....33⅓%
Cor. Heavy Strap...60&5%
Cor. Ex. Heavy T....50&10%

Extra 10&10.

Screw Hook and Strap. { 6 to 12 in..lb. 3¾¢ / 14 to 20 in..lb. 3½¢ / 22 to 36 in..lb. 3¼¢

Screw Hook and Eye:
⅜ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch .....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*26*	*28*	*31*	*35*
Galv. Funnel	*43*	*48*	*52*	*56*
Jap. Funnel	*33*	*36*	*39*	*43*

Extra 10&5%

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes—Eye—
Scovil and Oval Pattern ..... 60&10@60&10&10%
Grub, list Feb. 23, 1899 ..... 70&10@75&10%
D. & H. Scovil 30%
Am. Fork & Hoe Co. (Scovil Pattern) 60%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit $3.20
Ft. Madison Cotton Hoe ..... 70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz. ..... 70&10%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₱ doz. 40&5%
Junior Size ..... ₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz., 60&10%
Ft. Madison Dixie Tobacco Hoe ..... 75&10&7½%
Kretsinger's Cut Easy ..... 70&10%
Warren Hoe ..... 45&10%
W. & C. Ivanhoe ..... 75&2%
B. B. 6 in., Cultivator Hoe $3.40
B. B., 6½ in. $3.50
Acme Wedding ..... ₱ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ₱ doz. $5.25

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders—Bit—
Angular, ₱ doz. $24.00 ..... 45&10%

Door—
Bardsley's, Iron, 40%; Brass and Bronze 25%
Empire 50%
Pullman 35%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip 50%
Superior 33⅓%

File and Tool—
Nicholson File Holders and File Handles ..... 33⅓@40%

Fruit Jar—
Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz. $1.25

Trace and Rein—
Fernald Double Trace Holder, ₱ doz. pairs $1.25
Dash Rein Holder, ₱ doz. pairs. $1.25

Hones—Razor—
Pike Mfg. Co., Belgian and Swaty, 50%; German 33⅓%

Hooks—Cast Iron—
Bird Cage, Reading 40%
Clothes Line, Reading List 40%
Clothes Line, Stowell's 70%
Coat and Hat, Reading ..... 45&20%
Coat and Hat, Stowell's 70%
Coat and Hat, Wrightsville ..... 60&5%
Harness, Reading List 40%
Harness, Stowell's 60%
School House, Stowell's 70%

Wire—
Belt 80%
Wire C. & H. Hooks ..... 70@70&10%
Bradley Metal Clasp Wire, Coat and Hat, 70&10%; Ceiling ..... 70&10%
Columbian Hdw. Co., Gem ..... 70&5%
Parker Wire Goods Co., King ..... 70&10%
Western W. G. Co. Molding 75%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $1.50.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—See Wrought Goods

Miscellaneous—
Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz. $3.00
Grass, common grades, all sizes, per doz $1.75
Whiffletree ..... *lb. 5%@6¢*
Hooks and Eyes:
Brass ..... 60@60&10%
Malleable Iron ..... 70@70&10%
Coyel Mfg. Co. Gate and Scuttle Hooks 40%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder ..... 80&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition ..... *ft. 5 @ 6 ¢*
3-ply Guaranteed ..... *ft. 8 @ 9 ¢*
4-ply Guaranteed ..... *ft. 10 @11 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade ..... *ft. 8 @ 9 ¢*
Fair Quality ..... *ft. 10 @11 ¢*

Irons—Sad—
From 4 to 10 ..... *lb. 3 @3½¢*
R. B. Sad Irons ..... *lb. 3¼@3½¢*
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Tops	83	80	93	91
Tin'd Tops	88	85	98	95

New England Pressing ..... *lb. 3¾@4¢*

Bar and Corner—
Richards Mfg. Co., Bar, 60&10%; Corner 60%

Pinking—
Pinking Irons ..... *doz. 80¢*

Irons, Soldering
See *Coppers.*

Jacks, Wagon
Covert Mfg. Co.:
Auto Screw ..... 30&2%; Steel, 45%
Lockport 50%
Lane's Steel ..... 30&5%
Richards' Tiger Steel, No. 150 ..... 50&10%
Smith & Hemenway Co.'s 25%

Ladder—
Richards Mfg. Co., Ladder Jacks. 50%

Kettles—
Brass, Spun, Plain ..... 20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c. 30%
Wilkinson Shear & Cutlery Co. 60%

Corn—
Wilkinson Shear & Cutlery Co., Wilcut Brand Knives and Hooks. 60%
Winnington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List ..... 75&5@75&10%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's ..... 66⅔@70%
Watrous 16⅔%
L. & I. J. White ..... 20&5@25%

Hay and Straw—
Serrated Edge, per doz. $5.50@5.75
Iwan's Sickle Edge ..... ₱ doz. $9.50
Iwan's Serrated ..... ₱ doz. $10.00

Mincing—
Buffalo ..... ₱ gro. $13.00

Miscellaneous—
Farriers' ..... *doz. $3.00@$3.25*
Wostenholm's ..... ₱ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip ..... *gro. $1.25@$1.40*
Carriage, Jap., all sizes ..... *gro. 40@45¢*
Door, Mineral ..... *doz. 65@70¢*
Door, Por. Jap'd ..... *doz. 70@75¢*
Door, Por. Nickel ..... *doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Allith Mfg. Co., Reliable 50%
Lane's Store 25%
Myers' Noiseless Store Ladders 45%
Richards Mfg. Co.:
Improved Noiseless, No. 112 ..... 50%
Climax Shelf, No. 113 ..... 50%
Trolley, No. 109 ..... 50%

Ladles, Melting—
L. & G. Mfg. Co. (low list) 20%
P. S. & W. ..... 40&10%
Reading 60%

Lanterns—Tubular—
Regular, No. 0 ..... *doz. $4.35@4.50*
Side Lift, No. 0 ..... *doz. $4.60@4.75*
Hinge Globe, No. 0 ..... *doz. $4.60@4.75*
Other Styles ..... *40@40&10%*

Bull's Eye Police—
3-inch ..... *$4.25@4.50*

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron 50%
Stowell's Badger, Cast Iron 50%

Latches—Thumb—
Roggin's Latches, with screw ..... *doz. 35@40¢*

Door—
Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.30
Richards' Bull Dog, Heavy, No. 125 ..... 50&5%
Richards' Trump, No. 127 ..... $1.50
Stowell's Steel 50%

Leaders, Cattle—
Small ..... *doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—
See *Pumps—*

Lifters, Transom—
R. & E. 10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.50*	*2.25*	*2.00*
75 feet	*$1.75*	*1.55*	*1.10*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3. 40%
Solid Braided Masons' 30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ..... ₱ gr. 20%
Masons' Lines, Shade Cord, &c.: White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50 ..... 25%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 ..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines 40%
Clothes Lines White Cotton 20%
Shade Cord, Cotton or Linen 20%

Locks—Cabinet—
Cabinet Locks 33⅓%

Door Locks, Latches, &c—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co. 40%
R. & E. Mfg. Co. 10%

Elevator—
Stowell's 50%

Padlocks—
R. & E. Mfg. Co. Wrought Steel and Brass ..... 75&10%

Sash, &c.—
Iron Patent:
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock .. 35%
Reading 40%

Machines—Boring—
Com, Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Swan's Improved ..... 40&10%
Jennings', Nos. 1 and 4 ..... 25&7½%
Millers' Falls 5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—
Reisinger Invincible Hand Power .... ₱ doz. $18.00

Fence—
Williams' Fence Machines ..... each, $5.50

Hoisting—
Moore's Anti-Friction Chain Hoist. 30%
Moore's Hand Hoist, with Lock Brake 20%
Moore's Cyclone, High Speed Chain Hoist 25%

Ice Cutting—
Chandler's 12½%

Washing—
Boss Washing Machine Co.: Per doz.

Boss No. 1	$57.00
Boss Rotary	$57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.60

Mallets—
Hickory ..... 45&5@50%
Lignumvitæ ..... 45&5@50%
Tinners' Hickory and Applewood ..... *doz. 45&5@50%*

Mangers, Stable—
Swett Iron Works 50%

Mashers, Vegetable—
Western, W. G. Co., Potato ..... 60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list. 50%
Keystone Wire Matting Co.:
Keystone 50%
Ideal 50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co. ..... 20@25%
National list Jan. 1, 1902 ..... 30%
Parker's Columbia and Victoria .. 33⅓%
Parker's Box and Side ..... 50&10%
Swift, Lane Bros. Co. 25%

Motors Water—
Divine's Red Devil 30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest ..... *all sizes, $1.85@2.00*
Cheap ..... *all sizes, $2.00@2.50*
Better Grade ..... *all sizes, $2.50@4.50*

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental 60%
Great American 70%
Great American Ball B'r'g, new list. 70%
Quaker City 70%
Pennsylvania 60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf 50%
Pennsylvania Horse ..... 33⅓&5%
Pennsylvania Pony ..... 40&5%
Granite State:
Style A, Low Wheel ..... 70&10%
Style B, Low Wheel ..... 70&5%
Style C, High Wheel, spcl. disct., 70&10%
Style D, High Wheel, spcl. disct. 70%
Philadelphia:
Styles M., S., C., K., T. ..... 70&10&5%
Style A, all Steel ..... 60&10&5%
Style E, High Wheel ..... 70&10&5%
Drexel and Gold Coin, special list. 40%
Horse ..... 40&5%
Pony ..... 40&5%
36-in. Horse ..... 30&10%
Eagle Horse ..... 30&5%
I. X. L. Horse 50%

Nails—
Wire Nails and Brads, Miscellaneous ..... 87½@87½&10%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	25	21	20	19	18	..40&5%
Champlain	28	26	25	24	23	..50%
Coleman	13	12	12	11	11	..net
New Haven	23	21	20	19	18	..40&5%
Livingston	19	18	17	16	16	..10%

Western ..... ₱ lb 8¼¢
Jobbers' Special Brands ..... *per lb. 9@10¢*

Picture—

	1½	*2*	*2½*	*3*	*in.*
Brass H'd	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head	*..*	*1.10*	*1.10*	*1.10*	*.. gro*

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: *Off list.*
Square, Blank or Tapped ..... *4.80¢*
Hexagon, Blank or Tapped ..... *5.10¢*
Square, Bl'k, C., T. & R. ..... *5.10¢*
Hexagon, Bl'k, C., T. & R. ..... *5.70¢*
Hot Pressed:
Square, Blank ..... *5.00¢*
Hexagon, Blank ..... *5.40¢*
Square, Tapped ..... *4.70¢*
Hexagon, Tapped ..... *5.10¢*

Oakum—
Best ..... *lb.. 6¼¢*
U. S. Navy ..... *lb.. 6¢*
Navy ..... *lb.. 5¢*
Plumbers' Spun Oakum ..... *8¾¢*
In carload lots ⅛¢ lb off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper ..... 50&10%
Tin or Steel ..... 65&10&5@70%
Zinc ..... 65&10&5@70%
Chase or Paragon:
Brass and Copper ..... 50&10%
Tin or Steel ..... 65&10%
Zinc ..... 65&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers, &c. ..... 60@60&10%

Openers—Can—*Per doz.*
Sprague, Iron Handle ..... *30@35¢*
Sprague, Wood Handle ..... *35@40¢*
Sardine Scissors ..... *$1.75@$3.00*
Vim Tin Shear and Can Opener, ₱ doz., 75c.; per gro., $7.50
Yankee Can and Bottle Opener, ₱ doz., net $0.75
Little Gem, ₱ doz., net $0.65

Egg—
Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope ..... *20@25¢*

Rubber—
(Fair quality goods.)
Sheet, C. I. ..... *11@12¢*
Sheet, C. O. S. ..... *11@12¢*
Sheet, C. B. S. ..... *12@13¢*
Sheet, Pure Gum ..... *40@45¢*
Sheet, Red ..... *40@50¢*
Jenkins' '96, ₱ lb. 80¢ 25%

Miscellaneous—
American Packing ..... *lb. 7@10 ¢*
Cotton Packing ..... *lb. 16@25 ¢*
Italian Packing ..... *lb. 9@12½¢*
Jute ..... *lb. 4@ 4½¢*
Russia Packing ..... *lb. 8@11 ¢*

Pails, Creamery—
R. M. Co., with gauges, ₱ doz., No. 20, $3.75; No. 1200, $8.40.

Pails, Water, Well, &c.—
See *Buckets.*

Pans—Dripping—
Standard List ..... 65&7½&10@70%
Edwards, Royal Blue ..... 65&7½%

Fry—
Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Roasting and Baking—
Regal, R. M. Co., ₱ doz., Nos. 5, $3.75; 10, $4.75; 20, $5.40; 30, $6.00.
Savory, ₱ doz., net, Nos. 200, $8.75; 400, $16.50; 2000, $14.00; 2500, $16.80.
Simplex, ₱ doz.:

No.	40	50	60	140	150	160
	$2.50	3.00	3.50	2.75	3.35	4.00

Paper—Building Paper
Asbestos: *lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft. ..... *3½@5¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft. ..... *6¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in. ..... *36@75¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll ..... *40@50¢*
Medium weight, 30 lbs. to roll ..... *50@55¢*
Heavy weight, 40 lbs. to roll ..... *65@70¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton *$50.00*
Red Rope Roofing, 250 sq. ft. per roll *$1.75*

Tarred Paper—
1 ply (roll 400 sq. ft.), ton ..... *$34.00@$38.00*
2 ply, roll 108 sq. ft. ..... *68¢*
3 ply, roll 108 sq. ft. ..... *98¢*
Slater's Felt (roll 500 sq. ft.) .. *75¢*

Sand and Emery—
Flint Paper and Cloth ..... *50&10@—%*
Garnet Paper and Cloth *25%*
Emery Paper and Cl'h ..... *50&10@60%*

Parers—Apple—
Goodell Co.:
Family Bay State ..... ₱ doz. $15.00
Improved Bay State ..... ₱ doz. $36.00
New Lightning ..... ₱ doz. $7.00
Turn Table '98 ..... ₱ doz. $6.00
White Mountain ..... ₱ doz. $5.00
Bonanza Improved ..... each $7.50
Dandy ..... each $10.00
Eureka Improved ..... each $20.00
New Century ..... each $20.00
Ranger ..... each $25.00
Livingston Nail Co.:
Daisy ..... ₱ doz. $4.00
Little Star ..... ₱ doz. $5.00
Rocking Table ..... ₱ doz. $6.20
Reading Hardware Co.:
Advance ..... ₱ doz. $4.00
Baldwin ..... ₱ doz. $4.00
Reading 72 ..... ₱ doz. $5.25
Reading 78 ..... ₱ doz. $6.25

Potato—
Saratoga ..... ₱ doz. $7.00
White Mountain ..... ₱ doz. $6.00

Picks and Mattocks—
List, Feb. 23, 1899 ..... *70&5@70&10%*
Cronk's Handled Garden Mattock, ₱ doz. No. 2, $2.60; No. 3, $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pincers—
Vaughan & Bushnell Mfg. Co.:
Blacksmiths', per doz., 10 in., $5.00; 12 in., $5.50; 14 in., $6.00.
Carpenters' Claw, per doz., 6 in., $2.00; 8 in., $2.75; 10 in., $3.50.

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in.....40&10&5%
Extra Heavy, 2-6 in....50&12&5%
Fittings .....60&10&5%

Pipe, Merchant—
	Consumers, Carloads. Steel. Blk.	Galv.	Iron. Blk.	Galv.
	%	%	%	%
⅛ & ¼ in...	61	48	57	41
⅜ in.....	66	52	59	41
½ in.....	68	56	61	49
¾ to 6 in....	72	62	66	56
7 to 12 in....	69	54	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 82%
Second-class 85%
NOTE.—Market irregular.

Pipe, Stove—
	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual.....30@30&10%
Bench, second qual...40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 60%

Iron Planes
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06.....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....₩ doz. $8.00

Plates—
Felloe .....lb. 4@4¼¢
Self-Sealing Pie Plates (R. M. Co.), ₩ doz. $2.00.....50%

Pliers and Nippers—
Button Pliers.....75@75&10%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
The Nettleton Mfg. Co. Reversible Cutting Nippers.....40%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%
Vaughan & Bushnell Mfg. Co.:
Gas Burner, per doz., 5 in., $2.50; 6 in., $3.00.
Gas, per doz., 7 in., $3.50; 8 in., $3.75; 10 in., $4.50.
Nippers, Horseshoers' Cutting, 40%; Hoof Paring.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Duplex.....33⅓%
Woods' Extension.....33⅓%

Poachers, Egg—
Buffalo Steam Egg Poachers, ₩ doz., Nos. 00, $3.75; 0, $6.00; 1, $5.50; 2, $8.00; 600, $13.80.....40%

Points, Glaziers'—
Bulk and 1-lb. papers.....lb. 10¢
½-lb. papers.....lb. 9@10¼¢
¼-lb. papers.....lb. 9¾@11¢

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Glashrite, No. 2, 5 lb can (powder), each, $1.25; ₩ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ₩ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ₩ doz., $3.00; No. 2 (1 qu.), $5.00..40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gro. $4.50; ½ lb boxes, ₩ doz. $1.25; 1 lb boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz., $1.25.
Barkeepers' Friend Metal Polish, ₩ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₩ lb 10¢
Black Eagle, Liquid, ½ pt. cans.., ₩ doz. 75¢
Black Jack Paste, ¾ lb cans, ₩ gr. $9.00
Black Kid Paste, 5 lb can....each, $2.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ₩ gr. $5.75.....10%
Dixon's Plumbago.....₩ lb 8¢
Fireside .....₩ gr. $2.50
Gem, ₩ gr. $4.50.....10%
Japanese .....₩ gr. $3.50
Jet Black.....₩ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ₩ doz. $1.50

Poppers, Corn—
1 qt. Square..doz.$0.88; gro.$8.75
1 qt. Round..doz.$1.00; gro.$10.00
1½ qt. Square.doz.$1.10; gro.$11.00
2 qt. Square..doz.$1.35; gro.$13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....30&10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50
King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Robin Hood Sm'less Shot Gun..50&20%

Presses—
Fruit and Jelly
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ₩ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ₩ doz., $12.00.....33⅓&10%
Morrill's No. 1, Nail Puller, ₩ doz. $20.00.....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Scranton Co. Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B.....70%
Giant 50%
Staple Pullers, Utica and Davison 60%
Parrot Tack and Stub Puller, ₩ doz., 75c.; ₩ gro., $8.00

Pulleys, Single Wheel—
Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55
Inch	2	2¼	2½
Hot House, doz...	$0.65	.85	1.20
Inch	1¼	1½	1¾	2
Screw, doz....	$0.16	.19	.25	.30
Inch	1¾	2	2¼	2½
Side, doz.....	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&13%

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate per doz., 1¾ and 2 in....20@21¢
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ₩ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal .....70&5%
Niagara, No. 25, 1¾ in., 19¢; 2 in.....20½¢
No. 26 Troy..1¾ in., 14½¢; 2 in., 16¼¢
Star, No. 26..1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75&5@75&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list)....40&5%
Barnes Pitcher Spout.....75&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....₩ doz. $6.50
Flint & Walling's Fast Mail Hand, (low list).....50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher, ...75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50.....30%
Myers' Pumps (low list).....45%
Myers' Power Pumps.....45%
Myers' Spray Pumps.....45%

Pump Leathers—
Plunger and Lower Valve—Per gro.:
Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾	4
	$3.30	3.60	3.85	4.10	4.40

Plunger Cup Leathers—Per 100:
Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—
Saddlers' or Drive, good ..... *doz. 50@75¢*
Spring, single tube, good quality .....$1.75@2.00
Revolving (4 tubes) ..... *doz. $3.50@3.75*
Bemis & Call Co.'s Cast St'l Drive.50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi.....55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., ₩ doz., $1.44.....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₩ ft. 3¼¢
O. N. T. Rail.....$3.12
Griffin's:
xxx, ₩ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₩ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₩ 100 ft. $3.45
O. N. T., ₩ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in.....₩ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₩ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
McKinney:
Hinged Hanger Track, ₩ ft., 11¢, 63&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&5%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ₩ ft., No. 31, 9c.; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.
Stowell's:
Cast Rail.....₩ ft. 2¼¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 x 3-16 in., ₩ ft. 3.13¢
Wrought Bracket, 1½ x 5-16..₩ ft. 7¢
Sweet's Hinge Hanger.....60&5%
P. L. B. Steel Rail....₩ 100 ft. $3.12
No. 0, 1 x 3-16.....₩ 100 ft. $3.12

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor.....80&25%
Queen City Lawn, ₩ doz., 20 teeth, $2.85; 24, $3.00.....net
Anticlog Lawn, ₩ doz.....$4.00
Malleable Garden.....70&10%
Ideal Steel Garden, ₩ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Lawn Queen, 20-tooth....₩ doz. $3.15
Lawn Queen, 24-tooth....₩ doz. $3.25
Paragon, 20-tooth.....₩ doz. $2.70
Paragon, 24-tooth.....₩ doz. $2.75
Steel Garden, 14-tooth....₩ doz. $2.40
Malleable Garden, 14-tooth, ₩ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard, 60&10&5%
New 'Nicholson.....70&10@75%
See also Files.

Razors—
Liana Bo-ras-ic.....60%
Fox Razors, ₩ doz., No. 42, $22.00; No. 44, $20.00; No. 82, Platina, $25.00. } 33⅓%
Red Devil.....65%
Silberstein:
Carbo Magnetic, $20.00; Griffon No. 65, $15.00; Griffon No. 00, $12.00; all other Razors, 40%.

Safety Razors—
Kampfe Bros.:
Star Safety, 25%; Star Interchangeable, 25%; Star Safety Corn, 25%.
Silberstein 40%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, O 16, A 16, B 16, 4008, Rubber, Pomelo, Nickeled Pomelo.....30%
Aluminum German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P., 33⅓%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 02084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%.
986 PN, 2904 N, 904 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed 66⅔%
White Porcelain Enamel....60%
Solid Brass or Bronze Metal, ...40&10%

Revolvers—
Single Action.....95¢@$1.00
Double Action, except 44 cal..$1.80
Double Action, 44 caliber....$2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—
Bull Rings—
	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.30	1.50	1.90 doz.

Rea's Improved Self-Piercing, ₩ doz., Copper, 2 in., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—
Hill's Rings, gro. boxes.$4.00@$4.50
Hill's Ringers, Gray Iron..... *doz. 50@55¢*
Hill's Ringers, Malleable Iron.. *doz. 70@75¢*
Blair's Rings...per gro.$4.75@5.25
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..per gro.$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—
Copper .....33⅓ @35%
Carriage, Coopers', Tinners, &c.:
Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 42¢; 100 count, 51@58¢.

Rollers—
Acme, Stowell's Anti-Friction.....50%
Cronk's Stay, No. 50.....$1.00
Cronk's Bruckenroff No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%
Stowell's Barn Door Stay..₩ doz. $1.00
Swett's Acme.....50%
Screw and Spike Stay.....₩ doz. 60¢
Hinge Adjustable Stay.....₩ doz. 80¢

Rope—
Manila, 7-16 in. diam. and larger:
Pure .....lb., 13@13½¢
Sisal, 7-16 in. diam. and larger:
Pure .....lb., 9¼¢
Sisal, 7-16 in. diam. and larger:
No. 2 quality.....lb., 7¾@8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed .....lb., 7¾@8¢
Pure .....lb., 9¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed .....lb., 7@7½¢
Pure .....lb., 8¢
Cotton Rope:
Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. & up, lb..9¢
Thread, No. 2, ¼-in. & up, lb..8½¢

Wire Rope—
Galvanized .....37½&2½%
Plain .....45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@25&10%
Miscellaneous .....55@55&10%
Stephens' Combination.....55%
Stationers' 10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel .....50&10%
Lufkin's Lumber.....50&10%
Unson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 18 in. wide 60%
Band, ¾ to 1¼ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, 108, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws..30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws.45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 40%
Compass, Key Hole, &c..25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds File Co. 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades.....40&10%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&4&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades..30&10&5%
Sterling Hack Saw Frames..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00.. 15&10%

Scales—

Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... doz. $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz. $16.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales 50%
Chicago Scale Co.:
The Little Detective.....25 lbs 50%
Union or Family No. 2 ..... 60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list).25@35%
The Standard Portables 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz. $2.50@2.60
Ship....Light, $2.00; Heavy, $1.50
Chapin-Stephens Co., Box...30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1½, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ..... 20@20&10%
R. Bliss Mfg. Co., Hand..20&5@20&10%
Chapin-Stephens Co., Hand 20%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 ..... 75&15%
Coach, Gimlet Point, list Oct. 1, '99 ..... 75&10%
Hand Rail, list Jan. 1, '81.... 70&10@75%

Jack Screws—

Standard List.....70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron, Brass or Bronze....50@50&10%
Fillister Head, Iron, Brass or Bronze ..... 40@40&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron....87½&5@.. %
Round Head, Iron....85&5@.. %
Flat Head, Brass....80&5@.. %
Round Head, Brass..77½&5@.. %
Flat Head, Bronze....75&5@.. %
Round Head, Bronze.72½&5@.. %
Drive Screws.....87½&5@.. %

Scroll Saws—

See Saws, Scroll.

Scythes—

	Per doz.
Grass, No. 1, Plain....	*$6.25@6.75*
Clipper, Bronzed Webb..	*$6.50@7.00*
No. 3 Clipper, Pol'd Webb..	*$6.75@7.25*
No. 6 Clipper and Solid Steel,	*$7.00@7.50*
Bush, Weed and Bramble, No. 2.	*$6.50@7.00*
Grain, No. 1.....	*$8.25@8.75*
Bronzed Webb, No. 1..	*$8.50@9.00*
Nos. 3 and 4 Clipper, Grain..	*$8.75@9.25*
Solid Steel, No. 6.....	*$9.25@9.75*

Seeders, Raisin—

Enterprise ..... 25@30%

Sets—Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles. No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₩ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Cannon's Diamond Point, ₩ gro, $12, 40&10%
Mayhew's ..... ₩ gro. $9.00
Snell's Corrugated, Cup Pt.....40&10%
Snell's Knurled, Cup Pt.....40&10%
Victor Knurled Cup Pt....₩ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut....$20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut.....₩ doz. $8.00
Royal, Hand ..... ₩ doz. $4.50
Taintor Positive ..... ₩ doz. $6.75

Shaving—

Fox Shaving Sets, No. 90 ..... ₩ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co. 70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz. $1.50
Mounted Kitchen Sand Stone, ₩ doz. $1.50
Natural Grit Carving Knife Hones, ₩ doz. $3.00
Quick Cut Emery Carving Knife Hones, ₩ doz. $1.50
Quick Edge Pocket Knife Hones, ₩ doz. $2.50

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron ..... doz.$1.10@1.25
Wood ..... doz.$1.75@2.25
Bailey's (Stanley R. & L. Co.)....45%
Chapin-Stephens Co. ..... 30@30&10%
Goodell's ₩ doz. $9.00 ..... 15&10%
Wood's F1 and F2 ..... 50%

Shears—

Cast Iron..	*7*	*8*	*9 in.*	
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good ...	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap .. $5.00		*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....80@80&5%
Fair quality, Nickel..75@75&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 40&10@50%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%
Niagara Snips 40%
P. S. & W. Forged Handles, 25%; W. R. W. ..... 40&10%

Pruning Shears—

Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears..... 33⅓%
Disston's Combined Pruning Hook and Saw, ₩ doz. $18.00 ..... 25%
Disston's Pruning Hook only, ₩ doz.. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades..... 40%
P. S. & W. Co. ..... 40&10%
Wilkinson Shear & Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand. 60&10%

Sheaves—Sliding Door—

Stowell's Anti-Friction 50%
Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge..... 65&10%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 12 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%
Expert, 10, 12, 16 and 20 gauge, 33⅓&5%
Robin Hood, Low Brass ..... 20&5%
Robin Hood, High Brass ..... 30&5%
Indian, for Black Powder ..... 25&5%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Robin Hood:
Smokeless Robin Hood, Low Brass ..... 40&10%
Smokeless Comets, High Brass, 40&10&10&5%
Indian, Black Powder ..... 40&5%
Union Metallic Cartridge Co.:
New Club, Black Powders..... 40%
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade..... 40&5%
Smokeless Leader Grade...40&10&10%
Black Powder 40%

Shingles, Metal—Per Sq.

Edwards Mfg. Co.:	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in...	$4.25	$5.50
Dixie, 10 x 14 in....	4.50	6.00
Dixie, 7 x 10 in....	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg.$4.20
Steel ..... per keg.$3.85
Burden's, all sizes ..... ₩ keg $3.90

Shot—

25-lb. bag.
Drop, up to B $1.95
Drop, B and larger 2.20
Buck 2.20
Chilled 2.20
Dust 2.40

Shovels and Spades—

Association List, Nov. 15, 1902..40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle.....$2.75@$3.00
Wood and Mall, D. Handle, $3.25@$3.50

Sieves and Sifters—

Hunter's Imitation ..... gro.$9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50
Buffalo Metallic Blued, R. M. Co., ₩ gr.

1476	1678	1820
$15.00	$15.00	$18.00

Sieves, Seamless Metallic

—Per dozen.—

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard sizes:
12 x 12 to 22 x 33 in..... 60%
20 x 40 to 24 x 56 in..... 50%
24 x 60 to 24 x 120 in..... 30%
Barnes' low list:
Up to and including 20 x 36 in....50%
20 x 40 to 24 x 50 in..... 45%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless.. 60&5 tens
Victor A, Noiseless..60&5 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan..... 40%
Jockey 25%

Snaths—

Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—Silver Plated—

Good Quality..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous—

German Silver ..... 60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver 50%

Tinned Iron—

Teas ..... per gro. 45@50¢
Tables..... per gro. $0.50@$1.00

Springs—Door—

Bardsley's Spring and Check..... 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 39 in..... ₩ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider:	*Per 100 lb.*
Black ..... $4.75@$5.00	
Half Bright..... $4.75@$5.00	
Bright ..... $5.25@$5.50	

Painted Seat Springs:
1½ x 2 x 26.....per pr. 47@49¢
1½ x 3 x 28.....per pr. 69@71¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ₩ doz. $12.00
Enterprise ..... 25@30%
Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated.. } List Jan. 5, 1900.
Steel and Iron. } 75@—%
Rosewood Hdl. Try Square and T-Bevels ..... 60¢10¢10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40¢10@40¢10¢10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade..... doz. $1.25
Tinned Iron..... doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—

Barbed Blind..... lb. 6@6½¢
Electricians', Association list.. 80¢10¢10¢10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples..... per lb. 3½@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%
C. & A. Hoffmann's 30%

Steelyards—....50@30&10%

Stocks and Dies—

Blacksmiths' .....50@50&10%
Curtis Reversible Ratchet Die Stock..25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Chicago Wheel & Mfg. Co., 1904 list:
Gem Oil, Double Grit 65%
Gem Axe, Single or Double Grit.65%
Gem Slips 65%
Gem Razor Hones 50%
Pike Mfg. Co., 1907 list: ₩ lb
Arkansas St. No. 1, 3 to 8 in. $2.80
Arkansas St. No. 1, 8½ to 8 in. $3.50
Arkansas Slip, No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. .60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks..40%
Hindostan No. 1, Regular ₩ lb 8¢
Hindostan No. 1, Small..₩ lb 10¢
Axe Stones (all kinds) ..... ₩ lb 10¢
Turkey Oil Stones, Extra, 5 to 8 in. ..... ₩ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem, ₩ gro., 10 in., $8.00; 12 in., $10.80.
Pike Mfg. Co., 1901 list:
Black Diamond S. S..₩ gro. $12.00
Lamoille S. S. ..... ₩ gro. $11.00
White Mountain S. S. ₩ gro. $9.00
Green Mountain S. S. ₩ gro. $6.00
Extra Indian Pond S. S. ₩ gro. $7.50
No. 1 Indian Pond S. S. ₩ gro. $7.00
No. 2 Indian Pond S. S. ₩ gro. $4.50
Leader Red End S. S. ₩ gro. $4.50
Quick Cut Emery....₩ gro. $10.00
Pure Corundum..... ₩ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8
Emery Scythe Rifles, 3 Coat. $10
Emery Scythe Rifles, 4 Coat. $12
Balance of 1904 list 33⅓%

Electro (Artificial), ₱ gro., $12.00 ..... 33⅓%
Lightning (Artificial), ₱ gro., $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... ₱ gro. $9.00

Stops— Bench—

Millers Falls..... 15&10%
Morrill's, ₱ doz., No. 1, $10.00..... 50%
Morrill's, No. 2, $12.50..... 50%

Door—

Chapin-Stephens Co..... 60@60&10%

Plane—

Chapin-Stephens Co..... 20%

Straps— Box—

Cary's Universal, case lots....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket ..... doz. $1.60
Bullard, ₱ doz..... $4.00
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00..... 20%

Woven Fence—

Franklin..... ea. $3.75

Strops, Razor—

Star Diagonal Strop..... 25%
Carbo Magnetic, No. F..... ₱ doz. $8.50

Stuffers, Sausage—

Enterprise Mfg. Co..... 25@25&7½%
National Specialty Co., list Jan. 1, 1902 ..... 30&5%
P., S. & W. Co..... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₱ doz.
Superba, Crotch Mahogany.....$36.00
Triumph, Fancy Veneers.....$33.00
Parlor Queen, Figured Rosewood $30.00
Elite, Hungarian Ash..... $29.00
American Queen, Figured Mahogany $27.00
Ideal, Bird's-Eye Maple..... $25.00
Grand Rapids, Nickel, $24.00; Japan $22.00
Standard, Nickel, $22.00; Japan.$20.00
Crown Jewel, Nickel, $21.00; Japan $19.00
Crystal, Glass Top..... $36.00
Grand, 17 in. wide..... $36.00
Club, 24 in. wide..... $54.00
Hall, 28 in. wide..... $60.00
National Sweeper Co.: ₱ doz.
Louis XV, Roller Bearing, Gold Plated $120.00
Hepplewhite, Roller Bearing, Silver Plated..... $72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered..... $36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled..... $36.00
National Queen, Roller Bearing, Fancy Veneers..... $27.00
Loyal, Roller Bearing, Veneers, Nickeled $25.00
Triple Medal, Roller Bearing, Nickeled $24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled $24.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'rgs, N'kel.$20.00
Perpetual, Regular B'rgs, Jap..$18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled..... $36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned..... $33.00
Auditorium (26 in. case), Roller Bearing, Nickeled..... $54.00
Mammoth (30 in. case), Roller Bearing, Nickeled..... $60.00
Streator Metal Stamping Co.:
Eureka Japanned..... ₱ doz. $15.00
Model E, Sanitaire..... ₱ doz $25.00
Model A, Sterling..... ₱ doz. $25.00
Model B, Sterling, Nickeled..... ₱ doz. $23.00
Model B, Sterling, Japanned..... ₱ doz. $21.00
Model C, Sterling..... ₱ doz. $21.50
Model D, Sterling..... ₱ doz. $19.50

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots, $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks...90&25%
American Cut Tacks.....90&25%
Swedes' Cut Tacks.....90&25%
Swedes' Upholsterers'....90&35%
Gimp Tacks.....90&35%
Lace Tacks.....90&35%
Trimmers' Tacks.....90&25%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&40%
Hungarian Nails.....80&10%
Finishing Nails.....70%
Trunk and Clout Nails.....80%

NOTE.—The above prices are for Standard Weights.

Miscellaneous—

Double Pointed Tacks..... 90&½ or 5 tens

See also Nails, Wire.

Tanks, Oil and Gasoline—

R. M. Co., each:	Oil and Gasoline Emerald	Royal	Underground.
Gal.	Queen City.	Monarch.	
30	$3.40	$3.20	.....
60	$4.25	$4.00	$8.00

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
100	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin..50@—%
Patent Leather.....25@30&5%
Steel .....33 1-3&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓&35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&10&5%
Monitor, Cross Head, &c.70&2½%

Brick Ties—

Niagara Brick Ties..... 25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Haying—

Myers' Hay Tools..... 45%
Stowell's Hay Carriers, 45%; Hay Forks, 45%; Fork Pulleys, 40%.

Miniature—

Smith & Hemenway Co.'s, Davidson, ₱ doz., Nickel Plated, $1.50; Gold Plated..... $2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved..... 33⅓%
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....70&10%
Newhouse ..... 40@40&5%
Hawley & Norton..... 65%
Victor ..... 70&10%
Oneida Community Jump..... 50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₱ doz., $13.25; case of 24 ..... $11.50 doz.
No. 3, Rat, ₱ doz., $6.50; case of 50 ..... $5.75 doz.
No. 3½, Rat, ₱ doz. $5.25; case of 72 ..... $4.70 doz.
No. 4, Mouse, ₱ doz. $3.85; case of 150 ..... $3.00 doz.
No. 5, Mouse, ₱ doz. $3.00; case of 150 ..... $2.25 doz.

Trimmers, Spoke—

Wood's E 1..... 50%

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering..... 20%
Disston "Standard Brand" and Garden Trowels..... 30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ₱ gro. $6.00
Rose Brick and Plastering..... 25&5%
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ₱ doz. $16.00
Grocery ..... ₱ doz. $15.00
Daisy Stove Trucks, Improved Pattern ..... ₱ doz. $18.50
McKinney Trucks.....each, net $10.00
Model Stove Trucks..... ₱ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3	
Galvanized.	*$64*	*$76*	*$84*	*$96*	*10%*
Galvanized Wash Tubs (R. M. Co.):					
No	0	1	2	3	
Per gro	$64.00	76.00	86.00	96.00	
No.	10	20	30		
Per gro.	$88.00	98.00	108.00		10%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls.23@25¢
No. 12, ¼ and ½-lb. Balls.21@22¢
No. 18, ¼ and ½-lb. Balls.18@20¢
No. 24, ¼ and ½-lb. Balls.17@19¢
No. 36, ¼ and ½-lb. Balls.16@18¢
Chalk Line, Cotton ½-lb. Balls ..... 26@31¢
Cotton Mops, 6, 9, 12 and 16 to doz. ..... 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality...15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....14½@15½¢
American 3-Ply Hemp, 1-lb. Balls ..... 15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).10½@11½¢
India 3-Ply Hemp, 1-lb. Balls 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls. 10@11¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls .....13½@14½¢
Mason Line, Linen, ½-lb. Bls.47¢
No. 264 Mattress, ¼ and ½-lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply....B 9¢; A 10¢

Vises—

Solid Box.....50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co..... 40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 6A, $10.00; No. 10A, $22.50.
Tiger Machinists'..... 50%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel..... 25%
Star, Solid Jaw..... 40%
Hollands':
Machinists' ..... 40@40&5%
Keystone ..... 65&5&70%
Lewis Tool Co.:
Adjustable Jaw..... 30%
Monarch, 50%; Solid Jaw..... 50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip..... 15%
Merrill's 20%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe..... 55@60%
Prentiss ..... 20@25%
Snediker's X. L..... 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, ₱ doz.....$4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect..... 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe: 87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50

Dis. 15%

Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..... 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles..... 60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame.$4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector..... $3.55
Cable Cross, family size, stationary protector..... $3.60
Single Zinc Surface:
Naiad, family size, open back, perforated $3.00
Single Saginaw Globe..... $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back..... $3.95

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ⅞ 1 1⅛ 1¼ Inch. 10½¢ 11½¢ 12½¢ 16¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$5.90 5.00 3.70 3.50 3.30
The above prices are based on $5.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 ..... 50&10%

Wedges—

Oil Finish.....lb., .@3¢

Weights—Hitching—

Covert Mfg. Co..... 30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District.....$30.00
Southern Territory..$24.00@25.00
Western and Central Districts .....$25.00@28.50

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14 in., $3.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80%
10 to 18.....80&2½%
19 to 26.....80&7½%
27 to 36.....80&2½%
Galvanized:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 16.....72½&10&2½%
19 to 26.....75%
27 to 36.....72½%
Coppered:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 18.....72½&10&2½%
19 to 26.....75&10&5%
27 to 36.....75%
Tinned:
6 to 14.....75&10&2½%
15 to 18.....75&7½%
Brass.....24¢ lb., base
Copper .....32¢ lb., base
Cast Steel Wire..... 50%

Spooled Wire—

Annealed and Tinned..65&10@70%
Brass and Copper.....45@50%
Retailers' Assortments, per box, 2.50@3.50

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90&10%
Brass Wire Goods.....85&25%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Wire Netting..80&5%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ & 3 Mesh.....$3.40
Nos. 4 and 5 Mesh.....$3.65
No. 6 Mesh.....$3.90
No. 8 Mesh.....$4.40

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....75@75&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches.... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut..... 50%
Combination Black..... 40&5%
Merrick Pattern..... 50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle 70%
Elgin Wrenches, ₱ doz..... $6.25
Elgin Rethreading Attachment, only with one die, ₱ doz..... $6.25
Elgin Extra Dies, ₱ doz..... $3.00
Elgin Extra Jaws, ₱ doz..... $1.75
Elgin Monkey Wrench Pipe Jaws, ₱ doz..... $2.10
Gem Pocket..... 50%
Hercules 70%
W. & B. Machinist:
Case lots..... 50&5%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases..... 50&10&5%
Stillson 65%
Vulcan Chain..... 50%
Vaughan & Bushnell Mfg. Co. Handy, 70%; Always Ready..... 50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₱ gross, $7.50; ₱ doz..... $0.80

Wrought Goods—

Stables, Hooks, &c., list March 17, '92.....87½&10@—

Zinc—

Sheet.....per 100 lb., $8.85@$9.10

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:	
1-to 1⅞ in. round and square	₩ ℔ 2.10¢
1½ to 4 in. x ⅜ to 1 in	
1½ to 4 in. x ¼ to 5-16	₩ ℔ 2.30¢
Rods—⅜ and 11-16 round and square	₩ ℔ 2.30¢
Angles:	Cts ₩ ℔
3 in. x ¼ in. and larger (except 3½ in. and 4 x ¼ 2.50¢)	2.40¢
3 in. x 3-16 in. and ⅛ in	2.65¢
1½ to 2½ in. x ⅛ in	2.45¢
1½ to 2¾ in. x 3-16 in. and thicker	2.40¢
1 to 1¼ in. x 3-16 in	2.45¢
1 to 1¼ x ⅛ in	2.50¢
⅝ x ⅛ in	2.65¢
¾ x ⅛ in	2.75¢
⅝ x ¼ in	3.80¢
⅜ x 3-32 in	4.30¢
Tees:	
1 in	2.75¢
1¼ in	2.55¢
1½ to 2½ in	2.45¢
3 in. and larger	2.50¢
Beams	2.45¢
Channels, 3 in. and larger	2.40¢
Bands—1½ to 6 x 3-16 to No. 8	2.45¢
"Burden's Best" Iron, base price	3.20¢
Burden's "H. B. & S." Iron, base price	3.10¢
"Ulster"	3.10¢
Norway Bars	3.00¢
Norway Shapes	3.80¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery	2.10¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 14	₩ ℔ 2.95	3.00¢
Nos. 18 to 21	₩ ℔ 3.05	3.10¢
No. 27	₩ ℔ 3.20	3.50¢
No. 28	₩ ℔ 3.30	3.60¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ ℔ 11¾@14¢
Patent Planished	₩ ℔ A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16	₩ ℔, 3.35¢
Nos. 22 to 24	₩ ℔, 3.75¢
No. 27	₩ ℔, 4.20¢
No. 28	₩ ℔, 4.45¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Tin Plates—

American Charcoal Plates (per box.)

A.A.A. Charcoal:	
IC, 14 x 20	$6.60
IX, 14 x 20	7.85
A. Charcoal:	
IC, 14 x 20	$5.65
IX, 14 x 20	6.75

American Coke Plates—Bessemer—

IC, 14 x 20.....108 ℔	$4.65
IX, 14 x 20	5.65

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$9.00
IX, 20 x 28 with an 8 lb. coating	11.00

Seamless Brass Tubes—

List December 4, 1905. Base price 27c.

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 27¢

Copper Tubes—

List December 4, 1905. Base price 33¢

Brazed Brass and Bronze Tubes—

List June 6, 1898. Add to List 5¢ to 9¢

High Brass Rods—

Add to List 1¢ to 2¢

Roll and Sheet Brass—

List June 6, 1898. Add to List 3¢ to 5¢

METALS—

Tin—

Straits Pig ₩ ℔ 45 @45⅛¢

Copper—

Lake Ingot	nominal	₩ ℔ 25½@26 ¢
Electrolytic	nominal	₩ ℔ 24¾@25¼¢
Casting	nominal	₩ ℔ 25 @24 ¢
Sheet Copper Hot Rolled, 16 oz		₩ ℔ 32@34¢
" " " 14 "		" " 33@35¢

Sheet Copper Cold Rolled, 1¢ ₩ ℔ advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.
Bottoms, Pits and Flats ₩ ℔ 31¢ basis
Planished Copper, 1¢ ₩ ℔ more than Polished.

Spelter—

Western ₩ ℔ 7 @ 7⅛¢

Zinc.

No. 9, base, casks, ₩ ℔ 9.10¢ | Open ₩ ℔ 9.60¢

Lead.

American Pig ₩ ℔ 6¾@6⅞¢
Bar ₩ ℔ 7 @7¼¢

Solder.

½ & ½, guaranteed ₩ ℔ 27½@28 ¢
No. 1 ₩ ℔ 24¾@25¼¢
Refined Per. Lb. 21¾@22 ¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ₩ ℔ ..@17¢
Hallett's @16¢
Other Brands 14@16 ¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots nominal.
100-℔ lots nomina .

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents—
Copper, Heavy and Wire	₩ ℔ 17.50@18.00¢
Copper, Light and Bottoms	₩ ℔ 16.00@16.50¢
Brass, Heavy	₩ ℔ 12.25@12.75¢
Brass, Light	₩ ℔ 10.50@11.25¢
Heavy Machine Composition	₩ ℔ 16.00@16.50¢
Clean Brass Turnings	₩ ℔ 12.25@12.75¢
Composition Turnings	₩ ℔ 14.25@14.50¢
Lead, Heavy	₩ ℔ ....@ 4.75¢
Tea Lead	₩ ℔ ....@ 4.40¢
Zinc Scrap	₩ ℔ ....@ 4.70¢
No. 1 Yard Wrought, Long	$15.00@15.50
No. 1 Yard Wrought, Short	$14.75@15.25
Wrought Pipe	$12.25@12.75
No. 1 Machinery Cast	$15.75@16.75
Stove Plate	$13.50@14.00

THE IRON AGE

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